SCOTTS VALLEY WATER DISTRICT

2005 Urban Water Management and Water Shortage Contingency Plan

Prepared by:
District Staff
and
ETIC Engineering, Inc.

SCOTTS VALLEY WATER DISTRICT
URBAN WATER MANAGEMENT AND WATER SHORTAGE CONTINGENCY PLAN

DECEMBER 2005

Prepared For:

California Department of Water Resources
Office of Water Use Efficiency
Post Office Box 94236
Sacramento, CA 94236-0001

Prepared By:

District Staff

and

ETIC Engineering, Inc.
1333 Broadway, Suite 1015
Oakland, California 94612

TABLE OF CONTENTS

List of Tables

List of Figures

SCOTTS VALLEY WATER DISTRICT
2005 Urban Water Management and Water Shortage Contingency Plan

1 INTRODUCTION

The Urban Water Management Planning Act requires water suppliers to file an Urban Water Management Plan (UWMP) when the supplier provides water to more than 3,000 customers or supplies more than 3,000 acre-feet per year (AFY) (§10610 through 10656). The Act also requires a water supplier to provide an updated plan every five years.

1.1 Purpose

This revision to the Scotts Valley Water District's *2000 Urban Water Management and Water Shortage Contingency Plan* has been prepared to meet regulatory requirements and to guide the District's water conservation efforts through the year 2010. This plan also contains a Water Shortage Contingency Plan to be implemented during times of water shortage.

The Scotts Valley Water District (District) lies in the Santa Cruz Mountains, five miles inland from the Monterey Bay as shown in Figure 1-1. The District's total number of potable water services at the end of Calendar Year 2004 was 3,715.

This UWMP reviews activities for the period from 2000 through 2004 and outlines the District's activities through 2025, and is the third plan to be adopted by the District's Board of Directors (the prior plans covered the periods ending 1995 and 1999, respectively). Several significant changes have occurred since the District's second UWMP was adopted in 2000, which have resulted in the need for a broader, more sophisticated evaluation of the District's water supply, demand management, and operational alternatives.

Since the 2000 UWMP was submitted the District initiated the Recycled Water Program. This includes: the construction of a tertiary treatment plant (operated by the City of Scotts Valley); the installation of six miles of piping, a storage tank, a booster station, and metered connections. Deliveries began in 2002 and the program is operated under a Regional Water Quality Control Board (RWQCB) Master Distribution Permit (July, 2000).

1.1.1 Public Assistance and Regional Participation

Another major change that has occurred since the last UWMP is the District's increased commitment to conservation. This is apparent by the District's Board of Directors' March 10, 2005 adoption of the California Urban Water Conservation Council's Memorandum of Understanding (CUWCC MOU) and the District's membership to the CUWCC effective on June 8, 2005.

As a result of financial constraints experienced in the District during the recent years, the District has increased its focus on obtaining public assistance grants to enhance its water supply and conservation efforts, where possible. A significant step in this process has been to develop a Labor Compliance Program (LCP). The District's LCP was approved and adopted by the District's Board of Directors during the January 13, 2005 Regular Meeting. The LCP was submitted to the California Department of Industrial Relations (DIR). In accordance with the provisions of Title 8, California Code of Regulations, §16426, DIR granted initial approval effective March 1, 2005.

The District has obtained two Local Groundwater Management Assistance (AB303) grants from the California Department of Water Resources (DWR). In 2002-03, the District received $250,000 to construct three additional monitoring wells in southern Scotts Valley to obtain essential information concerning the hydrogeology of the Santa Margarita Groundwater Basin. Subsequently, in 2004, the District obtained another $225,000 to update and revise the Santa Margarita Groundwater Basin Numerical Model based on the revised hydrogeologic interpretation from the previous AB303 grant. The updated model also includes an estimate of sustainable yield, previously defined as perennial yield, for the Santa Margarita Groundwater Basin and related subbasins.

Although the District did not apply for an AB303 grant during Fiscal Year 2004-05, it supported and participated in the County of Santa Cruz's efforts to obtain such a grant to determine the feasibility of artificial and enhanced recharge in closed quarries in the vicinity of the District. As part of the participation, District staff has been serving on the County's Technical Advisory Committee which developed an RFP, selected a consultant, and prepared a grant application to allow this work to move forward. Unfortunately, the County's application for the AB303 grant was not successful, although the District continues to support regional efforts.

In addition, the District is working cooperatively with the County of Santa Cruz and other local water suppliers to implement a regional planning effort that will apply the approaches and techniques of integrated resources planning (IRP) to support appropriate facility and resource decisions. IRP is an inclusive process that begins with the premise that a wide range of traditional and innovative supply-side and demand-side (conservation) resources must be considered. The process provides information on potential consequences and aids in judging the value of the trade-offs among resources strategies. Once the IRP is completed, the associated agencies will apply for Proposition 50 funds to implement various IRP components. The District's portion of these funds would be for construction of recycled water main extensions and evaluation of potential artificial recharge projects.

The District has also submitted other Proposition 50 grant applications, described below:

- Multi-Agency Regional Intertie Project (under Chapter 3, Water Security) – this project would regionally intertie five local water suppliers: Scotts Valley

Water District, San Lorenzo Valley Water District (SLVWD), City of Santa Cruz, Lompico County Water District, and the Mount Hermon Association.

- Low-Level Arsenic Removal Enhancement Project (under Chapter 4a.2, Contaminant Treatment and Removal and under Chapter 6b, Contaminant Removal) – this project would add microfiltration as an additional treatment step at the District's El Pueblo Water Treatment Facility to improve arsenic removal through existing pressure filters.

- Identifying Source of Dichlorobenzene Plume Along Scotts Valley Drive (under Chapter 4a.4, Drinking Water Source Protection) – this project would follow up on findings of the 2003 Drinking Water Source Protection (DWSAP) addendum and attempt to identify the responsible party for a contamination plume impacting the District's El Pueblo Wellfield.

The results of these preliminary applications are still pending, although the District received a letter from the California Department of Health Services (CADHS) regarding the Multi-Agency Regional Intertie Project (under Chapter 3). The August 4, 2005 letter states "the proposed project is eligible (or partially eligible) for funding under this program". The District was ranked as #24 on the Funding Priority Ranking list for non-disadvantaged communities.

1.2 Public Review and Adoption of the UWMP

In accordance with §10642 of the Urban Water Management Planning Act and section 6066 of the Government Code, the District must hold a public hearing within 30 days of the circulation of the Plan and prior to adoption of the UWMP. A public notice must be posted before the public hearing. The UWMP must be presented to the Water District's Board of Directors for review and adoption. The adopted plan must be filed with the Office of Water Use Efficiency in the Department of Water Resources no later than December 31, 2005 and will be used by District staff to guide the District's water conservation efforts through the year 2010. As required by Water Code sections 10621(a)(b), the District will update the UWMP again by December 2010.

The Draft UWMP was distributed for review and comment beginning on November 8, 2005. Written comments were received through November 25, 2005 and public hearing was held on December 8, 2005. This UWMP has been modified where appropriate, to incorporate comments received from the public, interested organizations, and other agencies. This UWMP was adopted on December 15, 2005 by the District's Board of Directors through an adoption resolution.

1.3 CEQA Compliance

Preparation and adoption of UWMPs pursuant to the provisions of Water Code §10652 are statutorily exempt from the California Environmental Quality Act (CEQA). This exemption is clarified in Section 15282(w) of the CEQA Guidelines (14 CCR §15282w).

1.4 Report Content and Organization

The content of this UWMP is governed by the following:

> *Article 2. Contents of Plans, §10630. Legislative Intent.*
> *It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.*

The District is required to file a UWMP because the current customer base of 3,773 exceeds the plan filing requirement of 3,000. The Legislature has provided for smaller agencies by allowing the contents of the plan to be completed, to the extent practicable. Therefore this plan cannot and should not be compared to the plans of larger agencies.

The District's UWMP addresses all Water Code requirements for such a plan. The following is an index to locate each requirement within the document (in the order of the referenced Water Code Section):

Table 1-1 UWMP Index

Water Code Section	Chapter	Subsection	Content Description
10620(d)(1)(2)	1	1.5	Coordination with appropriate agencies
10620(f)	1	1.6	Maximization/Import minimization plan
10621(a)	1	1.1, 1.2	Plan updated every five years
10621(b)	1	1.5	City and County notification and participation
10631(a)	2	2.1	Service area information
10631(b)	2	2.4	Water sources
10631(b)(1-4)	2	2.4.1	Groundwater as source
10631(c)(1-3)	2	2.5	Reliability of supply
10631(c)	2	2.4	Water sources not available on a consistent basis
10631(d)	2	2.5.2	Transfer or exchange opportunities
10631(e)(1)(2)	2	2.3, 2.4.2	Water use provisions

10631(f) (A-N)	5	5.4	Review of DMMs for completeness
A	5	5.4.1	Water survey for residential customers
B	5	5.4.2	Residential plumbing retrofit
C	5	5.4.3	System water audits
D	5	5.4.4	Commodity rates
E	5	5.4.5	Landscape conservation
F	5	5.4.6	High-efficiency washing machine rebate
G	5	5.4.7	Public information
H	5	5.4.8	School education
I	5	5.4.9	Conservation for commercial and industrial accounts
J	5	5.4.10	Wholesale agency programs
K	5	5.4.11	Conservation pricing
L	5	5.4.12	Water conservation coordinator
M	5	5.4.13	Water waste prohibition
N	5	5.4.14	Residential ULF toilet replacement
10631(g)	4, 5	4.1.1, 5.3	Planned water supply projects & programs, including non-implemented DMMs
10631(h)	4	4.1.1	Planned water supply projects and programs
10631(I)	4	4.1.3	Opportunities for development of desalinated water
10631(j)	1	1.1.1	District is a CUWCC signatory
10631(k)	4	4.1.4	Wholesale water supplier
10632(a)	6	6.4, 6.7	Water shortage contingency stages of action
10632(b)	6	6.4, 6.5, 6.6	Three-year minimum water supply
10632(c)	6	6.4, 6.5, 6.6	Preparation for catastrophic water supply interruption
10632(d)	6	6.7.1	Prohibitions against specific water use practices during water shortages

10632(e)	6	6.7.2	Consumption reduction methods
10632(f)	6	6.7.3	Excessive use penalties or charges for excessive use
10632(g)	6	6.7.4	Revenue and expenditure impacts
10632(h)	Appendix	Appendix C	Water shortage contingency ordinance/resolution
10632(i)	6	6.7.5	Reduction measuring mechanism
10633	N/A	N/A	Recycling plan agency coordination
10633(a)	3	3.4	Wastewater system description
10633(a-d)	3	3.2, 3.4	Wastewater disposal and recycled water uses
10633(e)	4	4.1.1	Projected uses of recycled water
10633(f)	4	4.1.1	Plan to optimize use of recycled water
10634	2	2.5.3	Water quality impacts on availability of supply
10635(a)	3	3.2	Supply and demand comparison to 20 years
10635(a)	4	4.2.5	Supply & demand comparison: single dry year scenario
10635(a)	4	4.2.5	Supply & demand comparison: multiple dry year scenario
10635(b)	1	1.5	Provision of water service reliability section to cities/counties within service area
10642	1	1.5	Public participation and plan adoption
10643	1	1.2, 1.5	Review of implementation of 2000 UWMP
10644(a)	1	1.5	Provision of 2005 UWMP to local governments
10645	1	1.5	Where UWMP is available for public review

1.5 Agency Coordination and Public Participation

The District has provided for agency coordination and community participation in its urban water management planning efforts, as described above. Table 1-2 lists the various organizations that were contacted and those agencies that reviewed the Draft Plan. The Draft Plan was provided to these agencies for review and comment on November 8, 2005 and comments were received through November 23, 2005. Comments are addressed in the main body of this document and in Appendix A of the Final 2005 UWMP. In addition, a public presentation was provided to the District's Board of Directors and the public on December 8, 2005 to summarize the Final UWMP. This Final UWMP is provided to the City of Scotts Valley and the County of Santa Cruz concurrently with the final submission to the DWR in accordance with water code §10635 (b).

Subsequent to the public hearing on December 8, 2005, the Board of Directors adopted the final UWMP on December 15, 2005. The adoption resolution and proof of the public hearing are provided in Appendix B in accordance with water code §10642.

Table 1-2 Agency Coordination

Organization	Coordination and Public Involvement Actions					
	Helped write plan	*Contacted for Assistance*	*Sent Copy of Draft*	*Commented on Draft*	*Attended Public Meeting(s)*	*Sent notice of intention to adopt*
County of Santa Cruz		X	X	X		
City of Scotts Valley		X	X			
San Lorenzo Valley Water District		X	X			
Lompico County Water District			X			
Mañana Woods Mutual Water Co.			X	X		
Mt. Hermon Conference Center			X			
City of Santa Cruz, Water Dept.			X			
Scotts Valley Chamber of Commerce			X			
Soquel Creek Water District			X			

1.6 Resource Maximization/Import Minimization Plan

Although the District does not have a formal import minimization plan, multiple efforts to maximize the water resources of the District are underway. The District operates a comprehensive Groundwater Management Program (GWM Program), an expanding water recycling program, and is participating in the development of an Integrated Regional Water Management Plan (IRWMP). All of these efforts serve as management tools to maximize the water resources in the region and reduce the potential need for imported water.

2 DESCRIPTION OF THE DISTRICT

2.1 Location

The District is a County Water District, organized in 1961 under the California Water Code (County Water District Act, Water Code Sections 30000, *et seq.*). Its boundaries include most of the City of Scotts Valley as well as some unincorporated areas north of the City of Scotts Valley all within Santa Cruz County. The District lies in the Santa Cruz Mountains, five miles inland from the Monterey Bay. It is approximately five miles from north to south and one mile east to west with an approximate area of 5.5 square miles.

The District's service area relative to DWR established groundwater basins is shown on Figure 2-1. The District overlies a large portion of DWR Basin 3-27 and a small portion of Basin 3-21 and 3-50. The extent of the locally recognized Santa Margarita Groundwater Basin is also shown in Figure 2-1.

Figure 2-2 illustrates the District's location relative to nearby water suppliers and the City of Scotts Valley city limits. In accordance with water code §10620 (d) each of these water suppliers has received a draft copy of this document with the opportunity to comment.

2.2 Climate

The District has a mild climate. It is cooled in the summer by early morning and evening coastal fog. Annual rainfall in Scotts Valley averages approximately 43 inches per year, with higher average rainfall of 46 inches seen in the upper watershed of Bean Creek.

Table 2-1 presents the average annual rainfall measured at the El Pueblo Yard since 1981. Earlier records dating back to 1947 were collected at Blair ranch on the outskirts of Scotts Valley. The City of Scotts Valley has also maintained a precipitation gauge at the Scotts Valley WWTP since 1987. Table 2-1 also presents monthly annual values for temperature and evapotranspiration. These measurements are recorded at CIMIS Station 104 at the De Laveaga Golf Course in the City of Santa Cruz. Although the weather patterns are slightly different at the coastal station than in the Santa Cruz Mountains, the data provides information regarding the regional climate. Evapotranspiration from plants is variable, differing with the type of vegetation cover and with weather and soil conditions. Evaporation in the District is generally low in the winter months and peaks in the summer. Comparison of the monthly rainfall and evaporation amounts reveal that winter is characterized by a surplus of rainfall over evaporation or evapotranspiration. This rainfall is then available for runoff and natural groundwater recharge. Native vegetation evapotranspiration is reduced substantially in summer when rainfall is minimal and soil moisture is depleted. At this time, however, landscape irrigation demands become greatest. This contributes to high water demands in the late summer creating a contrast in demand and supply as seen in Figure 2-3.

Table 2-1 Local Climate Monthly Averages

Monthly Average	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total/ Ave
Rainfall 1982-2004 (inches) El Pueblo Yard	1.65	5.78	7.31	9.40	8.59	6.84	2.12	1.06	0.20	0.01	0.06	0.33	43.02
Average Temp, 1990-2004,CIMIS Sta 104 (degrees F)	56.60	51.70	49.90	47.60	48.90	56.20	55.20	57.70	59.20	60.50	61.80	61.90	55.60
ET_o CIMIS Sta 104, 1990-2004	2.96	1.64	1.30	1.36	1.93	3.26	4.70	4.87	5.32	5.03	4.84	3.60	40.80

2.2.1 Surface Water

Although the District does not currently utilize any surface water resources, two significant streams intersect the District, both of which are tributaries to the San Lorenzo River. These streams are also groundwater recharge/discharge locations within the Santa Margarita Groundwater Basin. Bean Creek drains 8.8 square miles at its United States Geological Survey (USGS) gauge just beyond the western boundary of the District (Figure 2-2). Bean Creek is the natural drain for groundwater in the Scotts Valley area and is perennial in its lower reaches. Carbonera Creek drains 3.6 square miles at its USGS gauge near the southern District boundary (Figure 2-2). Unlike Bean Creek, Carbonera Creek typically becomes dry or near dry during the summer months. Both streams recharge the local aquifer along certain reaches.

These streams are gauged on a continuous basis by the USGS. Both the Bean Creek (USGS 11160430) and Carbonera Creek (USGS 11161300) gauges are funded by the District as part of its groundwater management program. Historical and real-time readings of water levels and stream flows at the two gauges are available through the USGS satellite download website: http://waterdata.usgs.gov/ca/nwis.

2.3 Population

The District serves primarily residential customers, with some commercial development generally centered along the Scotts Valley Drive (old Highway 17) and the Mt. Hermon Road corridors. Computer software development and disk drive assembly are the major industry in the area. There is no commercial agriculture in the area.

Table 2-2 summarizes the current and projected population within the District's boundaries. Also summarized in the table are past, current, and projected population values for the City of Scotts Valley. The difference results from the incongruity between the City of Scotts

Valley city limits and the District's service area. Portions of Scotts Valley are served by the SLVWD as shown in Figure 2-2. The Association of Monterey Bay Area Governments (AMBAG) was retained during the preparation of this document to perform a population projection analysis specifically for the District's service area.

Table 2-2 Past, Current, and Projected Population for the District's Service Area

	2000	2005	2010	2015	2020	2025	2030
City of Scotts Valley*	11,385	13,182	13,667	13,864	14,062	14,169	14,275
Service Area Population*	10,385	11,195	11,636	11,850	12,056	12,173	12,288
Adjusted Population**	10,487	11,301	11,746	11,962	12,170	12,288	12,404

*Source: AMBAG, 2005

**Population adjusted to reflect metered connections outside of the district boundaries.

Currently, the District has 3,773 active water service connections that serve an estimated population of 11,195 (AMBAG, 2005). Twenty-one of these customers are supported by the recycled water program and include park/landscaping customers. The classification by customer type is presented in table 2-3 below. There are 117 metered District connections outside of the District's boundaries as of the end of 2004. Eleven of these connections are fire sprinkler service.

Table 2-3 Existing Customers

Customer Type	Number of Customer 8/31/05	Percent of Total	Percent Water provided by the District
RESIDENTIAL - SINGLE FAMILY	3,054	80.90%	62.11%
RESIDENTIAL - DUPLEX	68	1.80%	1.75%
RESIDENTIAL - TRI-PLEX	12	0.30%	0.30%
RESIDENTIAL - FOUR PLEX	21	0.50%	0.87%
RESIDENTIAL - MULTI PLEX	26	0.70%	2.01%
PARK	16	0.40%	0.12%
PARK/LANDSCAPE RECYCLED	21	0.60%	6.40%
LANDSCAPE	66	1.70%	4.20%
SCHOOL	22	0.60%	2.80%
FIRE SERVICE	202	5.40%	0.10%
COMMERCIAL	209	5.50%	13.80%
INDUSTRIAL	58	1.50%	5.50%
TOTAL	**3,773**	100%	100.00%

In addition, 145 unmetered hydrant connections are used on an as-needed basis. If these hydrants are used for purposes other than fire suppression (such as for construction water), a bulk meter is issued to the applicant for the length of the project.

As indicated, the majority of District connections are residential. This has important implications for water conservation, suggesting that focusing water conservation efforts toward single-family homeowners could result in considerable water savings. Additionally, a large percentage of the District's water is delivered to a small number of high usage customers; therefore conservation (or conversion to recycled water) by the District's large customers, could have a significant positive impact on future potable water demand. These demand management measures (DMMs) are discussed in more detail in chapter 5.

2.4 Source of Supply and Facilities

The District currently obtains 100% of its potable water supply from the Santa Margarita Groundwater Basin (the Basin). As a result, the Basin has been designated as a Sole Source Aquifer by the United States Environmental Protection Agency (USEPA). The District does not sell or export water to any other water purveyor or water supplier. The District has 55 miles of drinking water mains, eight drinking water storage tanks, nine booster pump stations, six active production wells, and four drinking water treatment

facilities. The District's distribution system also has eight pressure reducing (PRV) stations connecting zones to storage facilities.

In addition to potable water facilities, the District operates a 625,000-gallon recycled water storage tank and three miles of recycled water distribution mains to supply irrigation water to its landscaping customers. The source of recycled water is the tertiary water treatment plant operated by the City of Scotts Valley in conjunction with the District. The plant has a design capacity of 1 million gallons per day (MGD). At the end of 2004, recycled water provided approximately 2% of the total water supply to the District.

2.4.1 Groundwater Management

Located in the Santa Cruz Mountains and encompassing 5.5 square miles, the District overlies the Scotts Valley Groundwater Basin, designated as Groundwater Basin 3-27 (shown in Figure 2-1) by the DWR (DWR, 2003) and as a Sole Source Aquifer by the USEPA. The Scotts Valley Groundwater Basin is defined by DWR as encompassing 1.2 square miles of alluvium in Scotts Valley surrounded by Tertiary sedimentary formations.

The Tertiary Santa Margarita, Butano, and Lompico formations are the major water-bearing units in the area and their extent defines the locally-recognized Santa Margarita Groundwater Basin (the Basin). The Basin includes portions of DWR Basins 3-21, 3-27, and 3-50. The horizontal extent of the Basin is depicted in Figure 2-1. The DWR has not classified these basins as overdrafted and these basins are not adjudicated as defined by DWR Bulletin 118.

Since 1983, the District has actively managed the Basin through establishment of an integrated climatic, surface water, and groundwater monitoring program; regular reporting of water conditions; a safe yield study; implementation of a recycled water program; assessment of artificial recharge and water transfer options; ongoing groundwater exploration studies; development and revision of a regional groundwater numerical model.

Prior to the establishment of AB3030 guidelines and formalized GWM Plans, the District prepared annual "Water Resources Management Plans". These plans, similar to later GWM Plans, were prepared from 1984 through 1994. After California Water Code §10700 was enacted, providing authority for local agencies to adopt GWM Plans, the District prepared and adopted its formal Groundwater Management Plan in July 1994. This was one of the first complying plans in the state. The 2003-2004 Annual Report was formally submitted to the District's Board of Directors in June 2005 and is provided in electronic copy as Appendix C.

In addition to implementing its GWM Program, the District actively participates in the Santa Margarita Groundwater Basin Advisory Committee (SMGBAC), which also includes the SLVWD, the Lompico County Water District, the City of Scotts Valley, and the County of

Santa Cruz. The purpose of the Committee is to foster cooperation among local agencies to improve management of the Basin.

In 2001, the SMGBAC sponsored a technical White Paper to present a shared understanding of the state of the basin. Several data gaps, including aquifer parameters and water level measurements, were identified in the paper. The SMGBAC recognized the southern portion of the basin in the south Scotts Valley area as a particular area of concern in terms of inadequate data. The southern portion of the basin represents the only groundwater source for SLVWD, Mount Hermon Conference Center, Mañana Woods Mutual Water Company, and numerous private well owners. The District also has production wells in the south Scotts Valley area (two of the six wells discussed below, Wells #9 and #10).

Concentrated pumping in the south Scotts Valley area in the last three decades has resulted in significant water level declines in municipal production wells, although more recent data suggests that the rate of decline is tapering off with improved management practices such as the water recycling program.

In addition, the hydrogeology in the south Scotts Valley area was not well understood due to the folded and faulted nature of sedimentary deposits and the limited amount of reliable well data. To address gaps in geologic, aquifer parameter, and water level data in the South Scotts Valley area, the SMGBAC technical group proposed the addition of three groundwater monitoring wells and a more accurate modeling effort to confirm the revised hydrogeologic interpretation of the Basin. The District's first AB303 grant application also included funds for the construction of the new wells. Information gathered from the drilling, installation, and monitoring of these new wells enhanced the District's and other stakeholders' understanding of hydrogeologic conditions in this area

Information collected during the construction of these wells and the SMGBAC's interpretation of this new data was used to update the annual groundwater management program report and reinterpret the hydrogeological conditions in certain portions of the Basin. The revised hydrogeologic interpretation has been incorporated into the numerical groundwater model, performed under an AB303 grant. The numerical model is being directed by a Technical Advisory Committee consisting of geologists, engineers, and other water experts from the SMGBAC. The model construction and calibration is complete with a final report anticipated in early 2006. A significant use of the numerical model will be the development of sustainable yield volumes for the Basin and its subbasins based on the current distribution of pumping centers.

The study area for the numerical model encompasses the entire groundwater basin, which has been divided into five management subbasins: the San Lorenzo, Quail Hollow, Olympia, North Scotts Valley and South Scotts Valley subbasins (Figure 2-4). The North Scotts Valley and South Scotts Valley subbasins are of interest to this UWMP because the District produces all its groundwater from wells located within these subbasins. The

District's six active pumping wells and the boundaries of the subbasins used in the Santa Margarita Numerical Model are shown in Figure 2-4.

2.4.2 Groundwater Storage and Use

Stored groundwater is important to the District because it provides a continuous water supply during periods of drought. In 1998, Todd Engineers reported on behalf of the District that total groundwater storage for the Basin was 266,806 acre-feet (AF). A revised estimate based on the recent hydrogeologic interpretations and the numerical model was not available for the production of this document. The revised total storage volume will include the three main water-bearing units: the Santa Margarita, the Lompico, and the Butano Formations. The Butano Formation was recently identified as a water-bearing unit in the Scotts Valley area by the revised Santa Margarita Groundwater Basin hydrogeologic interpretation (ETIC, 2005).

Since 1988, a decline of groundwater storage has been documented in the Scotts Valley area. The numerical model was recently used to quantify the overall decline in storage from Water Year 1985-2004 (WY1985-2004). The total combined net decrease in groundwater storage for the Santa Margarita, Lompico, and Butano sandstones has been estimated at 38,510 AF or an average annual loss of about 1,925 acre-feet per year (AFY). This loss in storage is a basin-wide loss, calculated between 1984 and 2004 using available data from the numerical model. It represents a historic loss, including a severe 5-year drought and not necessarily a current or anticipated loss. It is also important to note that, in addition to the District, multiple water suppliers and private wells contribute to this decline. Persistent low groundwater levels and losses, which are a major concern for the District, led to the recycled water program. Table 2-4 provides the estimated pumped volumes by the District in the Basin from each formation since the 2000 UWMP.

Table 2-4 Groundwater Pumped from the Santa Margarita Groundwater Basin (AFY)

Water Bearing Unit	*2000*	*2001*	*2002*	*2003*	*2004*
Santa Margarita/Monterey	78	111	122	85	44
Lompico	1107	1202	1311	1452	1343
Butano	767	694	589	535	588
% of Water Supply*	**100**	**100**	**100**	**99**	**98**

*Additional water supply is recycled water

The location of potential new pumping centers is currently under evaluation by the District. The significant groundwater elevation declines in the Santa Margarita/Monterey formation in the South Scotts Valley subbasin indicate that increased pumping from this subbasin is not a viable option. The South Scotts Valley subbasin is also shared by other water

suppliers and private users, further discouraging increased pumping by the District. Taking into consideration the revised hydrogeologic interpretation of the Basin and the recent development of the numerical model, the District is currently investigating the feasibility of increased pumping in the North Scotts Valley subbasin at a yet to be determined location. The purpose of an additional pumping center will be to redistribute pumping throughout the District to reduce the potential for overdrafting the aquifer. The anticipated percentage of the District's groundwater supply is shown in Table 2-5 and is discussed in more detail in subsequent sections.

Table 2-5 Estimated Future Groundwater Pumping for the District

Groundwater Basin	*2005*	*2010*	*2015*	*2020*	*2025*
Santa Margarita Groundwater Basin (AFY)	1980	2000	2000	2000	2000
% of Water Supply*	**99**	**89**	**88**	**86**	**85**

*Additional water supply is recycled water

2.4.3 Groundwater Outflows

The major groundwater outflows include discharge to streams and springs and groundwater pumping. The numerical model quantifies the average outflow from the Basin to be at 10,723 AFY from the period of 1984 to 2004. This value includes water discharged to all streams, springs, and seeps within the Basin.

Groundwater pumping for all Basin users from the aquifer was estimated at 3,078 AF in WY2003-2004 (ETIC, 2005). Given that many Basin users are private domestic wells, estimations based on parcel data are used to account for unmetered use in the basin.

2.4.4 Sustainable Yield

The sustainable yield of the Basin is estimated to be approximately 4,200 AFY (Todd, 1995). This volume was reevaluated in 1998 by Todd Engineers using the basic water balance equation: inflow minus outflow equals change in storage. In brief, the 1998 study confirmed that the 4,200 AFY value for sustainable yield was reasonably accurate and conservative. The numerical model was recently used to produce a sustainable yield volume given the current pumping scheme in the Basin and the revised hydrogeologic interpretation. This volume was determined to be 3300 AFY, significantly less than the 4200 AFY determined to be available in the Basin using an overall water balance approach. The current spatial distribution of pumping in the Basin has caused significant groundwater elevation declines in certain subbasins and has resulted in an estimated sustainable yield of 3300 AFY for existing well locations. This volume represents the amount of water that is available to the water producers under the current pumping configuration without causing any overall change in storage.

The District is currently using the numerical model to identify the location of a new well and develop alternate pumping schemes that will increase the model calculated sustainable yield. The results of this analysis and the final results of the AB303 modeling study will be presented in the Scotts Valley Water District 2004-2005 Groundwater Management Program Annual Report and the Final Modeling Report, respectively.

Because of the existing well location constraints inherent in the current AB303 modeling study, the available groundwater resource used throughout this document will remain 4200 AFY as calculated from the water balance approach performed in 1998. This figure represents the volume of water that can be removed from the Basin given an optimal spatial distribution of wells and average aquifer conditions.

2.4.5 Numerical Model

The spatial distribution of groundwater production in the Basin is a significant controlling factor for determining sustainable extraction rates. The model represents a management tool to be used in the Basin to determine the redistribution of pumping centers and to protect the local groundwater resource.

More importantly, the model was used to establish sustainable yield values for the subbasins within the Basin. The subbasins were delineated by physical boundaries such as streams or faults that inhibit flow between subbasins. The District overlies two of these subbasins, the North Scotts Valley subbasin and the South Scotts Valley subbasin as depicted in Figure 2-4. Groundwater production from the North Scotts Valley subbasin is primarily from District facilities with a small percentage occurring from private domestic wells. However, the South Scotts Valley subbasin is subject to groundwater production from multiple water suppliers in addition to private domestic users. The numerical model will also be used to evaluate the water budget for each respective subbasin and establish ideal extraction rates relative to the spatial distribution of pumping.

Further application of the model includes the identification of a new well location and enhanced groundwater recharge locations within the basin. The District has included both of these items as part of its groundwater management program annual budget and will use the results to identify methods of minimizing potential losses in groundwater storage within the basin. The use of tertiary treated wastewater or recycled water will also provide the added benefit of reduced groundwater pumping from the subbasins which the District overlies.

2.4.6 Wells and Water Treatment Plants

The District has six operating production wells that range in depth from 350 feet to 1,750 feet. The wells are distributed throughout the District in both the North and South Scotts Valley subbasins. The District has an ongoing program of groundwater exploration and development that is intended to distribute future wells to make best use of available

groundwater storage and recharge while minimizing potential impacts on other wells, streams, and springs. As noted previously, portions of both the South and North Scotts Valley subbasins have been characterized by groundwater declines, with the associated declines in pumping capacity from the District production wells.

Rehabilitation of old wells and construction of new wells are needed to replace lost capacity and are part of the District's capital improvement program and maintenance budgeting. The District has designated $600,000 of its capital improvement program for the construction of a new well that will increase pumping capacity and redistribute pumping in the Basin. The construction of the new well will take place once locations have been identified.

The two District wells that are completed in the Butano formation are Wells #7A and #3B. The remaining four wells the District relies on for groundwater production are completed in the Lompico and Santa Margarita Sandstone throughout both the North and South Scotts Valley subbasins. The total well capacity at the end of 2004 for District wells is estimated to be 1,995 gallons per minute (gpm).

The groundwater produced in the District is high in iron, manganese, and hydrogen sulfide and therefore, requires treatment to meet the State water quality standards for aesthetics (i.e., Secondary MCLs). The District operates three pressure filter treatment plants for the iron and manganese removal and uses chemical treatment for hydrogen sulfide removal. Aeration equipment has recently been installed at the District's largest treatment plant and at Well #10, to remove hydrogen sulfide. The aeration equipment has reduced the use of chemicals at both of these locations. In addition, Granular Activated Carbon (GAC) filtration vessels are part of the Well #9 treatment facility to ensure that Volatile Organic Compounds (VOCs) previously detected in the well do not reach potable water supplies. The District also recently installed GAC filtration at Well #10 in response the increasing tetrachloroethene (PCE) concentrations measured in nearby monitoring wells. These PCE concentrations have been identified as part of the Scotts Valley Dry Cleaners plume previously discussed in the Water Quality Section. The GAC filtration will be brought online if PCE or any of its daughter constituents are detected in Well #10 raw water samples.

2.5 Reliability of Supply

The California Urban Water Management Planning Act requires that each water supplier provide an assessment of the reliability of its water supply during an average water year, during a single dry water year, and during multiple dry water years. The assessment of water supply reliability under normal or average conditions is best described above by the sustainable yield. The District overlies a significant portion of the Basin which has been determined to have an overall storage of 266,806 AF, thus the impact of drought years does not affect the absolute availability of supply, but rather the condition of storage, water level, and well performance under these conditions.

The ultimate supply of groundwater in the Basin is natural recharge resulting from precipitation in the Basin. Because the primary supply of water for the District, with the exception of recycled water, is the Basin, precipitation defines the supply of the District. Precipitation has been measured at the El Pueblo Yard in Scotts Valley since 1982. Prior to 1982, precipitation records date back to 1947 at the Blair Ranch on the outskirts of Scotts Valley in Santa Cruz County. The Blair Ranch precipitation records provide a historic sequence of 57 years. Table 2-6 defines average supply, single dry year supply, and multiple dry years supply as related to precipitation over the 57-year historic sequence.

Table 2-6 Supply Reliability Based on Precipitation

	Normal Water Year	Single Dry Water Year	Multiple Dry Water Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
Year	2002	1990	1987	1988	1989	1990	1991
Inches of Rain	42.33	20.58	23.42	23.81	30.67	20.58	26.64
% of Normal	100%	49%	55%	56%	72%	49%	63%

Although there have been significant years of drought, the overall storage in the Basin is currently sufficient to provide adequate resources for the District given the past, current, and anticipated future demand. However, the reliability of supply can be affected by the loss of individual wells resulting from catastrophe, such as an earthquake, or environmental contamination. These scenarios are discussed further in subsequent sections and Chapter 6 of this document.

The reliability of the recycled water resource of the District is unaffected by climactic conditions given that the source of recycled water is wastewater. The recycled water distribution system is susceptible to major catastrophes, such as a seismic event that can disrupt operation.

2.5.1 Groundwater Policy and Artificial Recharge

Despite recent years of average or above average rainfall, the persistence of reduced groundwater storage and long-term sustainability of groundwater supply are a concern. The ongoing GWM Program and AB3030 efforts of the District attest to a proactive groundwater policy. The GWM Program, as previously described, uses existing data to evaluate resources and recommend ongoing improvements to District practices, as well as identifying benefits.

As a direct policy initiative, in January 2000, the District Board of Directors adopted a water policy statement that recognized groundwater storage declines and initiated a moratorium

on the issuance of meters until the recycled water treatment plant began operation. The moratorium was lifted in 2002. Subsequently, new housing developments have been required to use recycled water for front-yard landscaping needs, if feasible, and the District has pursued an aggressive program of retrofitting its largest existing landscape customers from potable water supply to recycled water.

Another aspect of the Water Policy was to manage the water levels in the South Scotts Valley subbasin by pumping from other subbasins. Pumping increases in north Scotts Valley and El Pueblo Wellfield have resulted in significant drawdowns in those areas. The best approach to management is being evaluated as part of the ongoing groundwater modeling project and as part of the joint IRWMP effort.

A third, relatively recent initiative of the District has been to investigate artificial recharge in the Basin and secure the financing for related projects. Applications for construction grant funding under Proposition 13 have been unsuccessful. Negotiations with land owners at potential recharge locations have also been unsuccessful. The District will use the revised numerical model to identify other potential recharge locations. After suitable location(s) are identified, the planning process will be included in the IRWMP effort that is underway, and funding assistance may be sought as part of the County's Proposition 50 IRWMP grant application.

2.5.2 Water Transfers

There is a small (2-inch) emergency intertie with SLVWD for emergencies arising in either district. The intertie has been used twice to date, once for flow in either direction. The intertie is used primarily for water shortage emergencies and is not considered a regular water transfer option for the District.

Since the 2000 report was completed, further investigations of transfer options have been ongoing as part of the District's IRWMP efforts. The City of Santa Cruz has initiated a desalination project and, while the District has recognized that SLVWD's current transfer options are extremely limited at present (since the southern portion of SLVWD's system draws from the same groundwater subbasin as the District), the northern portion of SLVWD's system, which draws from both surface water supplies and a separate groundwater subarea, is not connected to the southern portion. To improve future options for both emergency and more routine transfers, the District has cooperated with both the City of Santa Cruz and SLVWD in applying for a Proposition 50 Security Grant to intertie these systems (San Lorenzo North and South, plus the City of Santa Cruz) in addition to connecting Lompico County Water District and the Mt. Hermon Conference Center water supply. The grant application has been listed as eligible by the CADHS and is being considered for funding.

2.5.3 Water Quality

The groundwater in the District is naturally high in iron, manganese, total dissolved solids, and hydrogen sulfide. It requires treatment to meet the related federal and state drinking water aesthetic or secondary standards.

In addition, the Scotts Valley area has a number of sites contaminated with volatile organic compounds (VOCs), including petroleum hydrocarbons (benzene, toluene, ethylbenzene and xylenes) and gasoline additives such as 1,2-dichlorethane (1,2-DCA) and methyl tertiary butyl ether (MTBE). Solvents such as tetrachloroethene (PCE) and trichloroethylene (TCE) have also been identified in the local groundwater.

Two District wells have been affected by petroleum hydrocarbons and gasoline additives. The Hidden Oaks Well was taken offline and is now considered a standby rather than an active well. Groundwater from Well #9 is treated with GAC to remove various VOCs to ensure drinking water standards are met. Near Well #9, Mañana Woods Mutual Water Company's well has been impacted and also has treatment in place to remove VOCs. The Camp Evers area gas stations continue to remediate gasoline contamination in this area.

Water from the El Pueblo Wellfield in Central Scotts Valley (District Wells #11A and #11B) is impacted by low concentrations of TCE, chlorobenzene, and dichlorobenzenes. The source of these contaminants has never been identified despite the Department of Toxic Substances Control (DTSC) attempt to do so in the mid-1990s. Currently, the levels of these contaminants in the groundwater are below drinking water standards. In addition, the pressure filters used for iron and manganese removal apparently remove these compounds to non-detectable levels since they have never been detected in the El Pueblo Water Treatment Plant's effluent water. This wellfield also has low levels of arsenic which is assumed to be naturally-occurring. The District submitted a Proposition 50 Drinking Water Source Protection Grant Application to identify the source of these contaminants and determine whether or not the presence of arsenic in these wells is related to the presence of the other contaminants. The status of this application is still pending.

Although Well #10 is in close proximity to a PCE/TCE plume from a local dry cleaners, it is, as yet, unaffected by any groundwater contamination. The District closely monitors this site and works closely with Central Coast Regional Water Quality Control Board to prevent the plume from contaminating the District's production well. The dry cleaners site has been undergoing interim remediation activities through mobile extraction and more recently a groundwater extraction and treatment system to control plume migration. Well #10 currently operates under a CADHS permit in which the raw water from Well #10 is tested monthly for PCE, TCE, and 1,2-DCA. Since increased concentrations of PCE were detected in nearby monitoring wells, the District has been testing Well #10 for PCE and daughter constituents on a weekly basis. In anticipation of the arrival of these constituents at Well #10, the District has also purchased GAC filtration units to be brought online in the event contaminants are detected in the well.

Previous and current efforts of the District to manage the Basin and monitor groundwater contamination have contributed to the projection of no changes to water supply as a result of water quality conditions.

Table 2-7 Current and Projected Water Supply Changes Due to Water Quality as a Percentage

Water Source	2005	2010	2015	2020	2025
Santa Margarita Groundwater Basin	0%	0%	0%	0%	0%

3 PAST AND CURRENT WATER USE

3.1 Water Production

The District's groundwater production from 1990-2004 is shown in Figure 3-1. Groundwater production in the District steadily increased with population until 1997. From 1997 to 2004 the production has remained at approximately 2000 AFY, despite an increase in metered connections. This stabilization can be attributed to above average rainfall during certain years, cool summers, increased water conservation efforts, and a 10% voluntarily reduction in use by customers per the District's request during significantly dry years. This voluntary reduction proved to be an effective DMM in reducing consumption and stabilizing the District's groundwater production.

Additionally, the District implemented a recycled water program in 2002. The recycling program provides another resource as part of the production supplied to District customers. Although the 2000 UWMP anticipated the recycling program's contribution to be greater than it currently is, the District continues to anticipate substituting approximately 350 AFY recycled water use for potable water use by 2010, or 17% of the current groundwater production. The District has also identified customers with the potential to convert from potable water to recycled water for landscaping uses. This potential has been estimated to be at least 500 AFY based on landscaping usage records, or approximately 25% of the current groundwater production.

3.2 Demand

Metered demands in the District are lower than metered production as shown in Figure 3-1. A portion of the discrepancy is due to the large, often inaccurate well meters used to record production. When one of the six well meters was replaced during 2004, the average gallons recorded during 24 hours of pumping dropped from approximately 670,000 gallons per day on the previous meter to 380,000 gallons per day on the new meter, or an apparent instantaneous drop in "production" for that well of 43%. The large discrepancy between production and metered demand in 1997, as shown in Figure 3-1, can possibly be attributed to this faulty meter. Other explanations for this discrepancy are leaks in the distribution system, releases resulting from ruptured pipes, or fire hydrant accidents. From 1997 to 2004, actual demand has averaged approximately 82% of groundwater production. With the replacement of older meters at well heads, the 2004 metered consumption was at 93% of the total demand. This indicates that the actual demand vs. production discrepancy is approximately 7%.

The past water resource available to the District has been solely from the Basin. With the rapid expansion of the water recycling program, the current and future water resources available to the District will be the conjunctive use of recycled water and groundwater production. Table 3-1 details the past, current, and future water resources available to the

District. Groundwater resources are quantified using the water balance approach described in Chapter 2, and represent an average of water available for pumping in the Basin without negatively impacting the aquifer or long-term storage volumes. Other demand is calculated using past pumping records and estimates of rural domestic users. Future water demands are discussed further in Chapter 4.

Table 3-1 Comparison of Past, Current, and Projected Supply & Demand During a Normal Year

(AFY)	2000	2005	2010	2015	2020	2025
Groundwater (sustainable yield)	4200	4200	4200	4200	4200	4200
Recycled Water	0	130	350	535	535	535
Purchased from USBR	0	0	0	0	0	0
Purchased from DWR	0	0	0	0	0	0
Purchased from Wholesaler	0	0	0	0	0	0
Transfers	0	0	0	0	0	0
Total Supply	**4200**	**4330**	**4550**	**4735**	**4735**	**4735**
SVWD Potable Demand	1952	1881	1891	1746	1785	1811
SVWD Recycled Water Demand	0	130	350	535	535	535
Total SVWD Demand	1952	2011	2241	2281	2320	2346
Other Demand*	1982	1993	2046	2100	2153	2202
Total Demand	**3934**	**4004**	**4287**	**4381**	**4473**	**4548**
Estimated Consumption (93% of Tot Demand)**	3344	3724	3987	4074	4160	4230
Total Supply Minus Estimated Consumption	**856**	**606**	**563**	**661**	**575**	**505**

*Includes other well production in the Santa Margarita Groundwater Basin

**Consumption in 2000 estimated to be 85% of total demand

3.3 Changes in Facilities

Important changes in water facilities have occurred during the last five years including the construction and start up of the advanced wastewater treatment plant (Tertiary Plant) and a recycled water distribution system. Although these are not potable water facilities, they represent an important component of the District's water resources. Also noteworthy is the continued expansion of the recycled water program through the construction of recycled

water mains and an increase in potential users. Other alterations/improvements to District facilities include:

- The addition of aeration facilities for hydrogen sulfide removal at Well #10;
- The addition of GAC filtration capabilities at Well #10;
- Overhaul of hardware and plumbing at the Orchard Run Treatment Plant;
- Ongoing rehabilitation of all production wells;
- Replacement of the Crescent booster station;
- Overhaul of the Little Hacienda booster station;
- The Replacement of Mt. Roberta storage tank and Villa Fonteney storage tank;
- The addition of the Glenwood storage tank adding 1.1 MG to the District's storage capacity;
- The addition of 3,027 linear feet of potable water mains; and
- The replacement of 116 linear feet of potable water mains.

3.4 Water Recycling

The City of Scotts Valley owns and operates the local wastewater treatment plant which treats wastewater from the City of Scotts Valley to a secondary level. The plant has a dry weather capacity rating of 1.5 MGD and a peak wet weather capacity of 5.0 MGD. The facility is a conventional activated sludge plant. Treated effluent discharge not directed to tertiary treatment for use as recycled water is pumped out of the area and discharged to the Pacific Ocean via pipeline. Table 3-2 provides wastewater volumes collected and volumes of water treated to recycled water standards.

Table 3-2 Wastewater Collected and Treated

(AFY)	2000	2005	2010	2015	2020	2025
Wastewater Collected & Treated in Service Area*	1101	1061	1381	1411	1450	1470
Recycled Water	0	130	350	535	535	535

*Wastewater Service Area is larger than Scotts Valley Water District Service Area

A tertiary treatment plant was recently constructed and added to the back-end of the secondary conventional wastewater treatment plant. A percentage of the effluent from the secondary treatment can be routed to the tertiary plant which processes the water through chemical flocculation, filtration (through biologically active media), nitrogen removal, and UV disinfection. The additional treatment is consistent in providing a product in accordance with CADHS guidelines for recycled water quality. The tertiary plant is designed to a maximum capacity of 1.0 MGD.

The tertiary plant is operated by the City of Scotts Valley's wastewater treatment staff, although the District has been responsible for financing all capital, maintenance, and operating costs for the facility. The RWQCB regulates plant operations under WDR Order No. 01-066.

The tertiary plant began operation in 2002 and currently operates only during the high landscape irrigation demand period, although it is anticipated to function on a more regular basis as more recycled water customers are added to the distribution system. When the tertiary plant is off-line, the District maintains water pressure in the Recycled Water Distribution System by "topping off" the recycled water tank with potable water (through an approved air gap).

The recycled water distribution system is currently operated by the District under WDR Order No. 01-067 of the RWQCB. The quantity of metered deliveries from the tertiary plant to the recycled water distribution system is reported quarterly in accordance with both the operating and distribution permits. All recycled water is currently used for landscaping purposes as shown in Table 3-3.

Table 3-3 Recycled Water Uses

Type of Use	Treatment Level	2005 AFY
Landscaping	Tertiary	130

*Landscaping encompasses landscaping irrigation and aesthetic water features.

Water quality testing of the tertiary plant's effluent has been consistently in compliance with CADHS standards. To date, nitrosodimethylamine (NDMA) has not been an issue due to the nitrogen-removal capacity of the unit processes at the tertiary plant. Ongoing monitoring is performed under both permits at the plant and in the distribution system. In addition, the District performs testing of nearby stream, spring, and groundwater monitoring wells to assure that regional use of recycled water has no significant impacts on surface or groundwater quality. These semi-annual sampling events are performed as part of the District's GWM Program.

At the end of October 2005, the District had twenty-one recycled water customers with an estimated total annual demand of 130 AFY. The District is currently delivering more recycled water to its customers than predicted in 2000 as seen in Table 3-4 below.

Table 3-4 Recycled Water Use – 2000 Projection Compared with 2005 Actual

Type of Use	2000 Projection for 2005 (AFY)	2005 Actual Use (AFY)
Landscaping	100	122*

*Recycled Water use through the end of October 2005.

Three of these customers were connected near the end of the last irrigation season so this value is an estimate and will remain so until at least one or two full irrigation seasons of data can be gathered. The District strives to expand the program through aggressive marketing and the pursuit of public funds to construct more infrastructure to support the program. The focus of the marketing campaign is to connect large landscape irrigation users and new developments in the vicinity of existing infrastructure first.

3.5 Water Rates

The District's water sales revenue has greatly increased since 1992 relative to groundwater production. The increase in revenue is due to several consumption rate increases that began in 1992. In addition, the District lost 69% of its property tax revenue through Educational Revenue Augmentation Funds (ERAF III). Rates were therefore increased in July 2004 to offset the financial loss. The water rates have also been increased to encourage water conservation by implementing a tiered rate structure. The highest rate block is $8.30 per thousand gallons in excess of 50,000 gallons per month. Table 3-5 lists the current rate structure for water usage in the District's service area.

Table 3-5 Monthly Water Commodity Charge

MONTHLY CONSUMPTION (in gallons)	FEBRUARY 11, 2005 (per Thousand Gals)
0 - 3,000	$2.57
3,001 - 7,000	$4.31
7,001 - 15,000	$5.23
15,001 - 25,000	$6.19
25,000 - 50,000	$7.78
Over 50,000	$8.30

Source: Ordinance #119-96, as amended, Section 4.27

The District's existing billing system does not allow for separation of the usage between residential, commercial, and industrial customers.

3.6 Recycled Water Rates

The District currently provides recycled water at 80% of the usage rates for potable water. There is no monthly service charge for recycled water customers.

3.7 Sewer Rates

The District does not provide sewer service. Sewer service is provided by the City of Scotts Valley. Therefore, sewer rates will not be discussed in this UWMP.

4 FUTURE WATER USE AND SUPPLY PROGRAMS

4.1 Changes in Conditions 2000 – Present

The District has analyzed the projections presented in the 2000 UWMP with the actual growth that occurred between 2000 and the end of 2004. Population growth rates have been smaller than previously estimated and metered demand has remained relatively stable as can be seen in Figure 3-1. Previous growth rates were determined using the City of Scotts Valley's population as a basis for build-out potential and growth patterns. The District's boundaries, as shown in Figure 2-2, are significantly different than those of the City and therefore possess different growth rates. Portions of the City of Scotts Valley and adjacent development are serviced by SLVWD and private water suppliers.

4.1.1 Increased Supply and Planned Water Supply Projects

Since the 2000 UWMP, the District has not added any new wells to augment its potable water supply. The District is currently identifying potential locations for a new production well that will service the District, and funding for this project has been approved. The construction of a new well will most likely increase water supply, although the main purpose is to redistribute pumping and increase the reliability of supply. The new well will be subject to the same supply constraints (i.e. drought conditions) detailed in the reliability of supply section in Chapter 3.

The recycled water program, which was inaugurated in 2002, has increased overall water supply by replacing a significant portion of the landscape irrigation demand in the District. In 2004 the recycled water program delivered 35 AF of recycled water to District customers. The recycled water program continues to expand as funds become available to install infrastructure to support more customers. As part of this effort, the District has identified potential recycled water demand by evaluating landscape irrigation in the District. The tertiary plant that currently supplies the recycled water has the capacity to supply these potential new customers.

4.1.2 Changes in Demand and Service Connections

The development of land is controlled by the *City of Scotts Valley's General Plan*. The *General Plan* predicts growth and housing needs of the City for the years 2002-2007. The *General Plan* was revised in early 2005 based on a recommendation from AMBAG, and anticipates a growth of 804 housing units for that period. The District's 10 year Capital Improvement Plan (C.I.P. 1996-2006) was designed for 843 additional water service connections or a net increase of 300 AFY during this time period. Between 2000 and 2004, the District added approximately 300 new metered connections. Although District connections increased approximately 9%, the demand in that same time period increased at a rate of approximately 6%, see Figure 3-1. This indicates that water conservation and efficiency efforts in the District have been successful. The demand increase from 1996

through 2004 has been approximately 130 AFY, although cooler weather and average precipitation conditions may have contributed to the lower-than-projected demand. Additionally, the demand increase between 2000 and 2004 has been 69 AFY with approximately 35 AF of recycled water supplying that demand in 2004.

The District's 5-year C.I.P. for the period 2005-2010 calls for the installation of a replacement well and various artificial recharge projects that are currently being investigated for feasibility.

4.1.3 Development of Desalinated Water

The District has limited opportunities for the development of desalinated water, given its geographical location relative to the ocean and lack of a brackish groundwater resource. Other water suppliers in the region such as the City of Santa Cruz and Soquel Creek Water District are pursuing desalinated groundwater as an alternative water resource during dry years. The District could potentially benefit from this program if a regional intertie project is funded by a pending Proposition 50 grant.

4.1.4 Wholesale Water

The District has no current or future plans to acquire wholesale water from a wholesale water agency.

4.2 Projected Demand

Growth in new service connections is expected to continue after 2005 and until the City of Scotts Valley reaches build out. The terrain in the Scotts Valley area reduces the available land for development; therefore new connections after 2005 will most likely be created by zone changes to a higher density, infill projects, and redevelopment. The *City of Scotts Valley General Plan* also encourages more high density development in Scotts Valley, which will increase the number of metered connections and demand within the District. Table 4-1 presents the projected number of metered connections in the District and the associated demand. These values are independent of the type of connection and therefore represent total demand and connections regardless of recycled or potable water.

Table 4-1 Projected Demand and Metered Connections

	2000	2005	2010	2015	2020	2025
	Actual		Projected			
Adjusted Population from Table 2-2	10,487	11,301	11,746	11,962	12,170	12,288
Water connections (# of meters)*	3,400	3,773	3,928	4,001	4,070	4,110
Water Demand (acre-feet)	1,952	2,011	2,239	2,280	2,320	2,343

*Projections made using actual capita/water connection ratio in SVWD in conjunction with AMBAG population projections.

Residential growth within the District's service area is expected to occur with the addition of more multi-family units and condensed housing. Single family homes are likely to use more water per capita due to large landscape irrigation needs per house, relative to a denser housing development where the water burden is shared. Table 4-2 presents the past current and anticipated water demand by customer type.

Table 4-2 Water Use by Customer Type, Past, Current, and Future

Customer Type	Demand (AFY)					
	2000	2005	2010	2015	2020	2025
Residential - Single Family Homes	1014	1249	1378	1401	1431	1437
Residential - Duplex	29	35	41	42	43	43
Residential - Triplex	5	6	8	8	8	8
Residential - 4-Plex	14	18	24	24	26	26
Residential - Multi Unit	33	40	52	57	58	58
Commercial - Retail	150	184	205	209	213	215
Commercial - Offices	76	93	104	106	107	109
Landscape - Domestic	164	202	225	229	233	236
Industrial	89	110	123	125	127	129
School	46	56	63	64	65	66
Parks	2	2	3	3	3	3
Public Buildings	10	12	13	14	14	14
Fire Services	2	2	3	3	3	3

4.2.1 Projected Demand 2005-2010

The District expects an increase of approximately 159 new service connections from 2005-2010. The District is planning for a population of 10,892 within the District's boundaries which includes a small percentage of users outside of the District. The water demand is estimated to reach 2,241 AFY in 2010, an increase of 230 AFY or 11.4%. This value was

developed using population projections from AMBAG and current usage rates of District customers.

The existing recycled water plant, with a capacity of 1 MGD, can meet the demand from recycled water customers through 2010 and beyond. The District anticipates 350 AFY of recycled water production by 2010. With the use of recycled water, the existing District water demand on the aquifer will remain at approximately 2000 AFY. The overall increase in demand will be offset by the use of recycled water for landscape irrigation. The recycled water plant is also large enough to allow surplus water for aquifer injection, stream enhancement and possibly other recharge projects. However, the District's current permit with the RWQCB is for landscape purposes only. Any other uses would require additional environmental impact studies and further permitting from the RWQCB and the CADHS.

4.2.2 Projected Demand 2010-2015

The District is projecting a growth of 70 new meter connections between the years 2010-2015. Water demand is anticipated to increase by 40 AF over the same time period to an annual value of 2,281 AF. This represents an increase of 13.4% from the 2005 demand. However, by 2015 the recycled water program is anticipated to have reached its current estimated potential of 535 AFY. The increase in water demand will not increase the demand on the aquifer due to the recycled water production offset discussed previously.

Water demand is anticipated to be proportional to population growth during this period without the addition of large industrial or agricultural users in the District. Growth rates are expected to decrease significantly relative to the fast pace growth of the area in the 1980s and 1990s. The 2015 population of the District is expected to be 11,087 (AMBAG, 2005).

4.2.3 Projected Demand 2015-2020

Meter connections are anticipated to increase by 69 during the years 2015-2020. Water demand is projected to total 2,320 AFY or an increase of 39 AFY over this time period. Demand will be 15.4% higher than in 2005. As indicated before, recycled water production will offset this increase and well production should remain at approximately 2000 AFY.

4.2.4 Projected Demand 2020-2025

Meter connections are anticipated to increase by 44 during the years 2020-2025. Water demand is projected to a total of 2,346 AFY in 2025. This time period represents a 26 AFY increase in demand and indicates the anticipated slow growth rate of the region during the same time frame. Water demand in 2025 is expected to be 16.7% greater than conditions in 2005, although well production demand should remain at approximately 2000 AFY due to the anticipated expansion of the Water Recycling Program.

4.2.5 Dry-Year Demand and Water Service Reliability

Water use patterns typically change during dry years. This is often the result of landscape irrigation demand increasing to compensate for the lack of precipitation. Although increased water demand during dry years has been identified in the District, it does not impact the Districts water service reliability. The groundwater storage beneath the District ensures a consistent supply during dry years. In addition, the District's Recycled Water Program is primarily marketed to landscape irrigation users to decrease this demand on the aquifer. The result is no disparity between water supply and demand values as described in water code *§10635 (a-c)*.

Supply and demand projections during a normal water year are presented in Table 3-1 as previously discussed. The changes in demand due to single and multiple dry years are enforced by the District to protect the overall groundwater basin health as discussed in Chapter 6. Projected demand in the District during a single dry year is presented in Table 4-3 and is based on conditions of WY1990, the driest year in the historic sequence.

Table 4-3 Projected Single Dry Year Supply and Demand

	Year			
	2010	**2015**	**2020**	**2025**
Available Supply (AFY)	2504	2635	2582	2533
% of Normal Supply	100	100	100	100
Demand (AFY)	2241	2281	2320	2346
% of Normal Demand	85	85	85	85
Difference (AFY)	**664**	**815**	**781**	**759**

Similarly, demand and supply during multiple dry years is presented in Table 4-4. The supply values increase incrementally in response to additional supply provided by the recycled water program. The demand volumes increase based on increase populations and decrease throughout the progression of a drought based on the District's various stages of action. The five multiple sequential dry years used in this analysis are WY1987 through WY1991. These years account for the driest consecutive dry years in the historic sequence.

Table 4-4 Projected Multiple Dry Year Supply and Demand

	Year				
First Sequence	**2006**	**2007**	**2008**	**2009**	**2010**
Available Supply (AFY)	2348	2348	2348	2348	2348
% of Normal Supply	100	100	100	100	100
Demand (AFY)	2011	2011	1810	1710	1609
% of Normal Demand	100	100	90	85	80
Second Sequence	**2011**	**2012**	**2013**	**2014**	**2015**
Available Supply (AFY)	2504	2504	2504	2504	2504
% of Normal Supply	100	100	100	100	100
Demand (AFY)	2241	2241	2017	1905	1793
% of Normal Demand	100	100	90	85	80
Third Sequence	**2016**	**2017**	**2018**	**2019**	**2020**
Available Supply (AFY)	2635	2635	2635	2635	2635
% of Normal Supply	100	100	100	100	100
Demand (AFY)	2281	2281	2053	1939	1825
% of Normal Demand	100	100	90	85	80
Fourth Sequence	**2021**	**2022**	**2023**	**2024**	**2025**
Available Supply (AFY)	2582	2582	2582	2582	2582
% of Normal Supply	100	100	100	100	100
Demand (AFY)	2320	2320	2088	1972	1856
% of Normal Demand	100	100	90	85	80

4.3 Implications of Future Demand and Existing Management

The population of the District's service area is anticipated to grow at a slower rate than in previous years. The slow rate coupled with the addition of the Recycled Water Program should help mitigate declines in the groundwater. Implications of the projected demand are as follows:

- Future demand can be met by the use recycled water, the redistribution of pumping, and by incorporating groundwater management goals to achieve the maximum sustainable yield available to Basin users;
- Resource management has been proactive in the District with major improvements planned;
- Construction of a new well to redistribute groundwater extraction will improve aquifer conditions and provide for better management of the District's existing water supply;
- Expansion of recycled water program will augment water supply and reduce the need for increased groundwater extraction; and,
- Continued groundwater management and the development of the numerical model will provide data to effectively meet the future water demands of the District without negatively affecting the Basin.

5 WATER DEMAND MANAGEMENT MEASURES

5.1 Introduction

The District has a history of commitment to water conservation and in June of 2005 became a member of the California Urban Water Conservation Council (CUWCC), which further commits the District to preserving its valuable water supply. Since the District recently became a signatory this year, no annual CUWCC report is provided in support of the DMM implementation. DMM implementation is detailed following the description of each DMM or Best Management Practice (BMP).

This chapter will discuss the 14 BMPs for conservation as outlined by the DWR. These practices are consistent with those presented in California Water Code §10631(f)(1). The BMPs established are considered generally accepted practices among water suppliers that result in more efficient use or conservation of water.

This chapter further describes the District's current efforts towards conservation and the District's future plans to implement reporting compliance as required by the CUWCC. Each of the management practices listed below as part of Water Code §10631(f)(1) are described in more detail in Section 5.3:

1. Water Survey Programs for Single-Family Residential and Multifamily Residential Customers
2. Residential Plumbing Retrofits
3. System Water Audits, Leak Detection, and Repair
4. Metering With Commodity Rates For All New Connections and Retrofit of Existing Connections
5. Large Landscape Conservation Programs and Incentives
6. High-Efficiency Washing Machine Rebate Program
7. Public Information Program
8. School Education Program
9. Conservation Program for Commercial, Industrial, and Institutional Accounts
10. Wholesale Water Agency Programs
11. Conservation Pricing
12. Water Conservation Coordinator
13. Water Waste Prohibitions
14. Residential Ultra-Low-Flush Toilet Replacement Program

5.2 History: Pre-2000 Water Conservation Programs

A number of important water conservation policies and practices were implemented by the District prior to 2000. These policies include the following:

5.2.1 Metering

The District is fully metered and charges all customers by volume of usage. This practice is recognized as a sound urban water management practice as well as a BMP measure four. The District's sources of supply are also metered, and the supply meters can be cross-checked against the inlet meters at the wells and treatment plants. These practices are consistent with those presented in California Water Code §10631(f)(1).

5.2.2 Water Conservation Pricing

An increasing block rate pricing structure has been in place since the early years of the District and all accounts are imposed usage fees accordingly. In 1992, two additional rate blocks, totaling five tiers, were adopted to encourage water conservation. In February of 2005, another block rate, totaling six tiers, was added to the rate structure to further encourage water conservation by the highest of users. Since March 1, 1992, there has been an average increase of 115% in each rate block to further encourage water conservation. This rate structure is consistent with BMP measure four (Metering with Commodity Rates) and BMP 11 (Conservation Pricing). The increasing block rate structure is outlined in Table 3-5.

5.2.3 Main Flushing in Winter Months

The District undertakes most water main flushing projects in late winter early spring when the daily water demand is lower in the system. The 2005 flushing program started on March 21st and throughout a seven day period it is estimated that between eighty and ninety percent of the entire distribution system of the District was flushed.

5.2.4 Leak Repairs

The District staff repairs all distribution system leaks as quickly as possible after they are discovered. Customers are encouraged to repair leaks as soon as they become aware of them and are further advised to repair any such leaks within 24 to 48 hours or be subject to the District's staff making the repair for them at up to four times the cost depending on the severity of the leak.

5.2.5 Pipeline Replacement

The District has an ongoing capital improvement program that methodically replaces older pipelines in the system to minimize leakage. If the District's distribution system suffers a failure to a main pipeline, the District is committed to repairing or replacing it in a timely and appropriate manner. The District operates an ongoing leak detection program that is used to identify pipelines that require repair or replacement.

5.2.6 Water Audits

The District's billing system is programmed to keep a record of each customer's usage for the same period of the previous year and print the comparison of the current period's consumption with the prior year's record.

Furthermore, the District's staff has developed a routine to check for any significant increases in usage over previous billing cycles on individual accounts. After records are reviewed, the customer is notified by telephone, by hanging a blue tag notice, or via mail regarding a possible leak. The notification requests that the customer check their interior and exterior plumbing in an attempt to resolve their leak as soon as possible.

5.3 Recent History and Current Water Conservation Programs, 2005-2010

An overview of the District's current conservation programs follows:

- The first part of the District's conservation program is to directly encourage conservation through water metering (all customers are metered) and an increasing block or tiered rate structure for water usage. Metering, alone, has proven to have a high success rate in demand management (i.e., voluntary conservation by customers). An increasing rate tier structure is still considered "leading edge" in the industry for further encouraging demand management and the District utilizes six tiers in the domestic usage rate structure.

- The next component of the conservation program is to provide retrofit rebates for customers who change existing plumbing to lower flow units. The District amended Ordinance 119-96 to provide retrofit credits in 1999. In fiscal year 2003-04 the District issued $6,400 in toilet "rebates" (actually credit towards future bills) and $8,800 towards washing machine "rebates." In fiscal year 2004-05, the District issued $5,400 in toilet "rebates" and $6,200 towards washing machine "rebates". The current ordinance follows:

Section 3.44 - Retrofit Credit

(a) Customers who replace existing water fixtures with approved low flow fixtures as per the Uniform Building Code will receive a credit upon their water bill to a maximum of 25% of the cost of the low flow fixtures, not to exceed $50.00 per account. The Customer is required to submit a copy of the receipt when requesting a credit.

(b) For ULF toilets, 1.6 gallon per flush, a $100.00 credit will be given for each higher water volume toilet that is replaced. The customer is required to submit a copy of the receipt when requesting a credit.

(c) A credit of $100.00 will be given for each washing machine that is replaced with an approved H-axial washing machine for residential application. The customer is required to submit a copy of the receipt when requesting a credit.

(d) A credit of $200.00 will be given for each washing machine that is replaced with an approved H-axial washing machine for commercial application. The customer is required to submit a copy of the receipt when requesting a credit. Commercial application is herein defined to mean any washing machine that is coin operated and is intended to serve more than one family, residential structure or premise.

- The District's more expensive conservation program is a Leak Adjustment Policy. If a customer finds a leak and can provide evidence of having repaired it, the District provides an adjustment to their bill for up to a four-month period during which the leak occurred. The goal in adopting this policy was to get people to repair leaks more rapidly, thus conserving water. During fiscal year 2003-04, the District credited customers $33,329.14 on this program and in fiscal year 2004-05, $32,488. The current policy follows:

Section 4.18 - Leakage Adjustment Policy

The Manager is hereby authorized upon written request of the Customer to adjust water billings for documented undetected leaks, (not the result of Customer negligence), in an amount of seventy-five percent (75%) of the existing water rates. An account may be adjusted one time per year, and be based upon no more than two (2) billing cycles per adjustment after the repair date. The District will credit not more than seventy-five percent (75%) of the difference between the existing charges and the Customer's average bill, based on the Customer's yearly average consumption prior to

the leak. The Customer must provide the District with a written adjustment request stating the date of repair, the type of repair, together with copies of any receipts. Requests for adjustments in excess of seventy-five percent (75%) will be denied. This adjustment policy is based on the decision of the Board of Directors and is final.

- The District also has an education program which, despite limited resources, had several successes during the past couple of years. In 2004, the District's annual Consumer Confidence Report (CCR), which is provided to all customers of the District, included a paragraph reminding customers that "Water is Too Precious to Waste". Together with SLVWD, the District conducted a free public landscaping and water conservation workshop in the spring at the District office (to celebrate May's Water Awareness Month). In June of 2005, the District's CCR notified customers that the District had became a signatory to the CUWCC, which represents the District's commitment to the best conservation practices available. The District also participates in a cooperative water agency committee, consisting of Soquel Creek Water District, Pajaro Valley Water Management Agency, the City of Watsonville's Water, and the City of Santa Cruz's Water Department. This committee mutually contributed funds for community awareness campaigns to better inform the public about conservation methods and practices. Through local radio stations, newspaper advertisements, and community events this outreach campaign has become highly regarded and is well attended by the community.

With limited staff and limited financial resources, the District cannot always do all the activities that a larger utility might undertake. However, the District is committed to conservation – both financially and technically whenever feasible.

5.4 Demand Measurements – Best Management Practices

Specific discussions of the various BMPs are contained in the following sections:

5.4.1 Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers

Implementation methods shall be at least as effective as identifying the top 20% of water users in each sector, directly contacting them (e.g. by mail and/or telephone) and offering the service on a repeating cycle; providing incentives sufficient to achieve customer implementation (e.g. free showerheads, hose end sprinkler timers, etc.) (Water Code §10631(f), 1-A)

This DMM involves providing interior and exterior water audits and water conservation incentive programs for single-family residential, multi-family residential, governmental, and institutional customers. With the acceptance of the District's membership into the CUWCC,

the District is committed to implementing an acceptable Water Survey Program (BMP1) by July 1, 2006.

The District installed the existing billing system in 1998. It was programmed to keep a record of each customer's usage for the same period of the previous year and print a comparison of the current period's consumption with the prior year's record. This will also be a feature of any new computerized billing system that the District installs.

The District staff uses this information to check for any large increases in the customer's usage. This is reviewed and the customer is notified by telephone and then sent a letter informing them they may have a leak on the property or in the residence. Advice and assistance is given where appropriate. This has been an exceptionally effective program and continues to be implemented. Customers have been responsive and notify the District as soon as any leak(s) is repaired. The customer receives a 75% credit on their water bill when they provide proof of repair on a leak (complete ordinance in Section 5.3 - 4.18). The District currently does not offer any free showerheads or other devices.

BMP 1 includes checking individual meters. The District has an ongoing program for checking, calibrating, and replacing customer meters that are over 15 years old or that have registered over 1,000,000 gallons of usage. This important program allows the District to (a) enhance revenues by ensuring payment for all water sold; (b) encourage conservation by ensuring that customers pay for all water delivered; and (c) increase the District's ability to account for all distributed water. This replacement program is ongoing.

Currently the District is reviewing all single-family and multi-family residential customers to determine the least intrusive, most helpful water survey audit program that it can make available to its customers. District staff has been introduced to other local agencies' active residential audit programs to help establish such a program.

The District currently has 3,054 single-family residential customers and 125 multi-family residential customers. By July 1, 2006, staff will contact 20% (approximately 610) of the District's single-family residential customers and 20% (approximately 25) of its multi-family residential customers by survey. The survey will be used to confirm the customer's indoor and outdoor usage components to further determine what water saving recommendations and assistance can be provided based on the individual customer's system. The District is committed to surveying 100% of these customers by June 30, 2016. At this time, the water savings for implementing a program of this nature cannot be accurately quantified since there no data is previously available, although the District will analyze the results of the surveys and replacements of fixtures to determine the water savings impact. Table 5-1 presents the projected number of surveys and estimates of expenditures and water savings.

Table 5-1 Water Survey Projections

Planned Water Surveys	2006	2007	2008	2009	2010
# Single family surveys	610	610	610	610	610
# Multifamily surveys	25	25	25	25	25
Projected expenditures ($)*	2000	2000	2000	2000	2000
Projected water savings (AFY)*	15	15	15	15	15

*Estimated, no surveys conducted prior to 2006

IMPLEMENTATION: *The District is committed to implementing an acceptable water surveying program by July 1, 2006 and will continue the efforts as standard operational procedures.*

5.4.2 Residential Plumbing Retrofits

Implementation methods shall be at least as effective as delivering retrofit kits including high quality low-flow showerhead to pre-1980 homes that do not have them and toilet displacement devices or other device to reduce flush volume for each home that does not already have ULF toilets; offering to install devices; and following up three times. (Water Code §10631(f), 1-B)

Retrofit programs generally focus on plumbing installed prior to 1992, in part reflecting the passage of the Federal Energy Policy Act of 1992, which restricted all newly manufactured faucets and showerheads to a flow of 2.5 gallons per minute (DWR, August 1994). Another key regulation is the requirement by the California Plumbing Code that ultra-low-flush (ULF) toilets be installed in all new construction starting January 1, 1992. The City of Scotts Valley enforces the plumbing standards within the Scotts Valley Water District boundaries.

The District encourages plumbing retrofits through distribution of the District's annual CCR and an informational service application provided to all new customers of the District. The District currently does not provide retrofit kits or low flow fixtures to its customers, although it is continually encouraging customers to replace any old and outdated fixtures with new low-flow devices and informs them of the financial advantages of doing so. The District documents and provides quarterly reports on retrofit credits provided to its customers.

By July 1, 2006, District staff will confirm the total number of residences constructed before 1992 and determine a strategy for mandating these customers to upgrade any existing outdated fixtures with new low-flow devices. Currently the District can not financially fund the fixtures to the customer or provide installation services, but for now the retrofit credits

are considered to be a good incentive for the customer to perform the upgrade themselves. As compliance of reporting is met and the replacement of the fixtures by customer base is determined, the District will reevaluate the cost effectiveness of providing the fixtures and installation services to the customer. Table 5-2 presents the projected number of plumbing retrofit devices distributed by the District. No devices were provided by the District to customers prior to 2006.

Table 5-2 Residential Plumbing Retrofit

Planned Plumbing Retrofit Distribution	2006	2007	2008	2009	2010
# Single family devices	0	0	0	0	0
# Multifamily devices	0	0	0	0	0
Projected expenditures ($)	0	0	0	0	0
Projected water savings (AFY)	0	0	0	0	0

***IMPLEMENTATION**: The current retrofit program will continue as the District's commitment of adopting an acceptable system to mandate retrofits is determined. By July 1, 2006 the District will have established the manner and means to mandate the upgrades and commits to having 100% of the homes utilizing low flow devices. It will be actively promoted with public information efforts (BMP 7) initiated in conjunction with any future voluntary water rationing programs.*

5.4.3 System Water Audits-Leak Detection and Repair

Implementation methods shall be as least as effective as at least once every three years completing a water audit of the water supplier's distribution system using methodology such as that described in the American Water Works Association's 'Manual of Water Supply Practices, Water Audits and Leak Detection'; advising customers whenever it appears possible that leaks exist on customer's side of the meter; and performing distribution system leak detection and repair whenever the audit reveals that it would be cost effective. (Water Code §10631(f), 1-C)

In the Annual Water Supply Report to the Department of Health Services Drinking Water Field Operations Division, the District staff performs a simple system-wide audit of the previous year's water production and water sales in order to quantify and review the un-metered water usage. Authorized uses such as water used for fire fighting, street cleaning, water sold through portable meters, and water used for filter backwashing at the treatment

plants are subtracted from the total to provide an estimate of "unaccounted-for" or "lost" water.

While this evaluation does not go as far toward tracing the specific causes of lost water as would a formal water audit, it is done annually, rather than every three years as suggested in BMP 3.

In order to have a more accurate annual audit of actual production relative to sales, the District has begun replacing the water well production meters and checking those against the treatment plant meters.

The District's pipeline system is only 35 years old and is considered to be a tight system. In August of 2005, the District retained a third party leak detection service to perform a leak detection survey of the entire distribution system resulting one small detected leak. The leak was fixed and no other significant leaks were detected. Table 5-3 and Table 5-4 present past and future system water audits performed by the District respectively.

Table 5-3 Past System Water Audits

	2001	2002	2003	2004	2005
% of unaccounted for water	26%	12%	21%	5%	5%
Miles of distribution lines surveyed	0	0	0	0	10.74
Miles of lines repaired	0	0	0	0	<1
Actual expenditures*	0	0	0	0	4103
Actual water savings (AFY)	0	0	0	0	0.4

Table 5-4 Future System Water Audits

	2006	2007	2008	2009	2010
% of unaccounted for water	5%	5%	5%	5%	5%
Miles of distribution lines to be surveyed	0	0	0	0	0
Miles of lines to be repaired	0	0	0	0	0
Actual expenditures*	0	0	0	0	0
Actual water savings (AFY)	0	0	0	0	0

*Does not include District staff's time to compile data

Customers are advised of possible leaks on their side of the meter as described above. The District's Leak Adjustment Program, described in the same section, provides further inducement for customers to repair leaks that are detected.

IMPLEMENTATION: *The District will continue to quantify the amount of unaccounted-for water on an annual basis and will respond to any significant increases as they are identified. In addition, the District will continue to repair all leaks in the distribution system as quickly as possible. The District will also continue to notify customers of possible leaks on their side of the meter as suspected by their meter readers or as reported by other persons. Both the on-going main replacement and meter replacement programs will be continued.*

5.4.4 Metering with Commodity Rates for all New Connections and Retrofit of Existing Connection

Implementation methods shall be requiring meters for all new connections and billing by volume of use. (Water Code §10631(f), 1-E)

As previously described the District's system is metered throughout and customers are invoiced by volume of usage. There is an increasing-block, tiered rate usage/commodity rate structure in place to encourage conservation and/or conversion to use of recycled water, whenever possible. The increasing block rate structure coupled with metered water usage, which is fundamental to water conservation, has been in place in the District for many years.

The District has an ongoing water meter replacement program for customer meters that are over 15 years old or have registered over 1,000,000 gallons of usage. Currently 80% or 3018 metered connections of the District's domestic water meters have been upgraded to meet this standard, and a total system upgrade is expected to be completed by the end of 2005.

IMPLEMENTATION: *This BMP has been in effect for many years and will be continued. In February 2005, the District added a sixth tier to the rate structure and increased the gap between tiers to further encourage conservation and conversion to recycled water use. Evaluations of meter function and reliability are reviewed every billing cycle and meters are repaired or replaced according to the results.*

5.4.5 Large Landscape Conservation Programs and Incentives

Implementation methods shall be at least as effective as identifying all irrigators of large (at least 3 acres) landscapes, contacting them directly, offering landscape audits using methodology such as that described in the Landscape Water Management Handbook prepared by the California Department of Water Resources and cost effective incentives to achieve customer implementation; providing follow-

up audits at least once every five years; and providing multi-lingual training and information necessary for implementation. In addition, enacting and implementing landscape water conservation ordinances, or if the supplier does not have the authority to enact ordinances, cooperating with cities, counties and the green industry in the service area to develop and implement landscape water conservation ordinances pursuant to the 'Water Conservation in Landscaping Act' (Government Code 65591 et. seq.). (Water Code §10631(f), 1-E)

The largest irrigators in the District are the Enterprise Business Campus (formerly Borland International), Scotts Valley School District's high school (playing fields) and the City parks. The three largest City parks have been converted to recycled water. Late in the summer of 2004, the high school was converted to recycled water, and in October of 2004 the Enterprise Business Campus was also converted to recycled water.

For those irrigators that now use recycled water there is a conservation incentive built into the recycled water pricing system. The District is currently evaluating the rates for possible additional incentives. In addition, the recycled water use site permits mandate periodic checks and assurances that no water is running offsite. Status of these visual checks is reported quarterly to the RWQCB and the Monterey Drinking Water Field Operations Branch of the CADHS.

Those large landscape users still on potable water have an even stronger incentive to audit themselves because the top tier water rate is now $8.30 per thousand gallons of water used. The District projects supplying recycled water to some 40 additional landscape water users within the next five years. The primary incentive to change to recycled water is the discounted cost of the water. However, in at least two cases, the District had to force conversions by citing Water Code §13551 and threatening to turn off potable water used for irrigation.

The District is not an agency of land use planning jurisdiction and although the District has adopted landscape water conservation ordinance (Ordinance #119-96, amended by Resolution #1-01), the District typically leaves the utilization requirements to the City of Scotts Valley to enforce. The District works closely with the City of Scotts Valley in adopting and implementing water conservation and recycled water ordinances. The City of Scotts Valley has such an ordinance (Resolution #1413) mandating use of recycled water if it is accessible to the project to be constructed. All new projects are required to comply for final approval. This ordinance is provided in Appendix B.

The City of Scotts Valley requires a landscape design plan to be submitted to the Planning Commission as part of the development plans. Plants specified in the Plan must be appropriate to the climatic, geologic, and topographical conditions of the site and must be grouped in hydrozones with other plants having similar water use requirements. At least ninety percent of the plants selected for non-turf areas must be drought tolerant varieties. The landscape plans are required to be submitted to the Planning Commission as a part of

the development plans for the site. The landscape plan is required to address function, energy use, environmental and aesthetic conditions specific to the site, as well as water conservation.

By July 1, 2006, the District is committed to identifying all dedicated irrigation metered customers and surveying their landscaping use. The survey will help staff determine the customer's usage habits in order to provide the customer with a budget of their landscape use and provide informational assistance on how they could potentially conserve usage.

> ***IMPLEMENTATION:*** *The District's volume pricing policy will remain in effect, providing strong financial incentives for the conservation of irrigation water because of the high volumes required. The District will also encourage all major irrigators to convert to recycled water as soon as it is available to individual sites. The District will continue to support the City of Scotts Valley's efforts to implement their water conservation ordinance and continue to promote water conserving landscaping in its public information programs. A landscape survey program will be implemented by July 1, 2006, to further assist customers in reducing their landscape water use. Staff will continue their efforts of out-reach according to the requirements outlined by the MOU of the CUWCC.*

5.4.6 High-Efficiency Washing Machine Rebate Program

> *Implementation methods shall be enacted to provide incentives for replacement of older less efficient washing machines with newer, high-efficiency models.* (Water Code §10631(f), 1-F)

The District allows a credit of $100 for each washing machine that is replaced with an approved H-axial washing machine for residential application and $200 for each washing machine that is replaced with an approved H-axial washing machine for commercial application. The District's rebate program is provided in its entirety in Section 3.44 Retrofit Credits. As with other rebate programs, the District documents and gives quarterly reports on retrofit credits provided to its customers. Actual rebates provided to customers prior to 2005 and projected rebates to be provided to customers through 2010 are presented in Table 5-5 and Table 5-6 respectively.

Table 5-5 Actual Washing Machine Rebates from 2001-2005

	2001	2002	2003	2004	2005
$ per rebate	100	100	100	100	100
# of rebates paid*	57	120	101	99	67
Actual expenditures ($)*	$5,700.00	$12,000.00	$10,100.00	$9,900.00	$6,700.00
Actual water savings (AFY)	N/A	N/A	N/A	N/A	N/A

*Through December 2, 2005
N/A - Not Available

Table 5-6 Projected Washing Machine Rebates from 2006-2010

	2006	2007	2008	2009	2010
$ per rebate	100	100	100	100	100
# of rebates paid	100	100	100	100	100
Actual expenditures ($)	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00
Actual water savings (AFY)	N/A	N/A	N/A	N/A	N/A

IMPLEMENTATION: *This program is on-going and will be continued. It will be actively promoted with public information efforts (BMP 7) initiated in conjunction with any future voluntary water rationing programs. Staff will continue their efforts of out-reach according to the requirements outlined by the MOU of the CUWCC.*

5.4.7 Public Information Program

Implementation methods shall be at least as effective as ongoing programs promoting water conservation and conservation related benefits including providing speakers to community groups and the media; using paid and public service advertising, using bill inserts; providing information on customers bills showing use in gallons per day for the last billing period compared to the same period the year before; providing public information to promote other water conservation practices; and coordinating with other governmental agencies, interest groups and public interest groups. (Water Code §10631(f), 1-G)

The District has conducted an extensive variety of public education activities over the past ten years. Some were aimed at motivating customers to respond to the drought situation, while others were more general and informational in scope. The following is a list of some activities that have been undertaken:

Brochures and Newsletters. General mailings, separate from the bimonthly billings, were sent to all customers to encourage water conservation. Water conservation pamphlets "Conserve Water, Inside and Outside Your Home and Business" were provided to all trailer parks, public libraries, and City offices. Newsletters are mailed out every 6-12 months to remind customers of conservation and inform them of other District activities. Water conservation flyers and brochures have been kept at the Customer Relations Representative's desk in the District Office and made available to interested customers coming to pay bills or make inquires.

Service Club Presentations. Management staff of the District has made presentations to local service clubs on water supply and water conservation related topics. This includes the Scotts Valley Rotary, Kiwanis, Lions, and Exchange Clubs. In addition, annual presentations are made to the City of Scotts Valley's City Council for their resources update meeting, which is televised locally.

Cooperative Agency Program. The District also participates in a cooperative water agency committee, consisting of Soquel Creek Water District, Pajaro Valley Water Management Agency, the City of Watsonville Water, and the City of Santa Cruz Water Department. This committee mutually contributes funds for community awareness campaigns to better inform the public about conservation methods and practices. Through local radio stations, newspaper advertisements, and community events, this outreach campaign has become highly regarded and is well attended by the community.

> ***IMPLEMENTATION:*** *The District's programs of informational pamphlets, newsletters and community presentations will continue on a routine basis. The level of public contact through the media will be increased in the event that voluntary or mandatory water rationing is enacted during the term of this plan. Staff will continue their efforts of out-reach according to the requirements outlined in the CUWCC MOU.*

5.4.8 School Education Programs

> *Implementation methods shall be at least as effective as ongoing programs promoting water conservation and conservation related benefits including working with the school districts in the water suppliers' service area to provide educational materials and instructional assistance.* (Water Code §10631(f), 1-H)

The District has joined with other water suppliers in Santa Cruz County to coordinate school programs on water conservation and wise water use. This includes professional players performing water related skits to the 3rd and 4th grade classes. These performances are incorporated into the 3rd and 4th grade curriculum on water conversation at the local elementary schools. The District furnishes teacher guides and activity books for the program. The District also has tours of its laboratory and facilities for these classes.

During the month of May, "Water Awareness Month" the District provides conservation and water wise workbooks to all 2nd and 3rd grade students (approximately 450 students) within the District's boundaries. The material is approved age appropriate for these students and is incorporated in their curriculum by the education staff at the schools. Each year the District evaluates the content and issues of the available conservation materials and provides the schools with an age appropriate instructional workbook.

IMPLEMENTATION: *The District will continue to work with the Scotts Valley Unified School District and the Private Schools in the area to support the inclusion of water conservation topics in their curriculum. Staff will continue their efforts of out-reach according to the requirements outlined in CUWCC MOU.*

5.4.9 Commercial, Industrial, and Institutional Water Conservation

Implementation methods shall be at least as effective as identifying and contacting the top 10% of the industrial and commercial customers directly (by mail and/or telephone); offering audits and incentives sufficient to achieve customer implementation; and providing follow-up audits at least once every five years if necessary. (Water Code §10631(f), 1-l)

The District's water sales to commercial and industrial accounts are a small part of the total water sales because the primary industry in the area is computer disk drive assembly and software generation. Their largest usage is for landscape irrigation. The District has access to tertiary water and will encourage landscape accounts to utilize recycled water if it is available to their site. The District currently does not offer water audits to the commercial and industrial accounts due to their low volume.

By July 1, 2006, the District is committed to implementing a survey for commercial and industrial accounts to determine their indoor and outdoor components in order to provide assistance on water saving recommendations and assistance. At this time, the water savings for implementing a program of this nature is not known, but the District will analyze the results of the surveys and replacements of fixtures to determine the water savings impact. Table 5-7 presents the projected number of survey to be completed in the next five years from the existing 267 commercial and industrial customers in the District.

Table 5-7 Conservation Programs for Commercial and Industrial Customers

	2006	2007	2008	2009	2010
# of on-site surveys to be completed	20	40	40	40	40
Will incentives be provided	Unknown	Unknown	Unknown	Unknown	Unknown
# of follow-up visits	5	5	5	5	5
Projected expenditures ($)	N/A	N/A	N/A	N/A	N/A
Projected water savings (AFY)	N/A	N/A	N/A	N/A	N/A

*N/A = not available, no prior data on cost or savings from surveys

IMPLEMENTATION: *The District will continue to work with all commercial and industrial accounts to improve their water use efficiency, particularly for landscape irrigation. Staff will continue their efforts according to the requirements outlined in CUWCC MOU.*

5.4.10 Wholesale Water Agency Programs

Wholesale Water Agency Programs are not applicable to the District as the District has no opportunity to either buy water from wholesalers or sell water to retailers (Water Code §10631(f-j)).

5.4.11 Conservation Pricing

Implementation methods shall be at least as effective as eliminating nonconserving pricing and adopting conserving pricing. For signatories supplying both water and sewer, this BMP applies to pricing of both water and sewer service. Signatories that supply water but not sewer service shall make a good faith effort to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer service. (Water Code §10631(f), 1-K)

The District has an inclining block rate for all potable water customers that began in 1992. The consumption start at $2.57 per 1,000 gallons for the first 3,000 gallons to $8.30 per 1,000 gallons for all consumption over 50,000 gallons per month (See Table 3-5). The District's rates were last revised effective February 11, 2005, although the same basic rate structure relative to the size of meter has been in effect for a number of years.

The District also has an inclining block rate for all recycled water customers. Currently, the rates are 80% of the potable rates and the rates are under review to possibly provide further incentive for use.

The District has no jurisdiction over the sewer rates set by the City of Scotts Valley. However, the Water District does supply the City with the consumption rates of the commercial and industrial users, for billing purposes.

IMPLEMENTATION: *The District will continue a conservation pricing rate structure.*

5.4.12 Water Conservation Coordinator

*Implementation methods shall be at least as effective as designating a water conservation coordinator responsible for preparing the conservation plan, managing its implementation, and evaluating the results. For very small water suppliers, this might be a part-time responsibility. For larger suppliers this would be a full-time responsibility with additional staff as appropriate. This work should be coordinated with the supplier's operations and planning staff (*Water Code §10631(f-l).

The Accountant/Office Supervisor effectively fulfills the function of a water conservation coordinator. The staff member has the responsibility for placement of the District's public service and advertising announcements and is responsible for administrating any survey or water rationing programs. This position has been considered the part time responsibility of one District staff member for the past five years and will continue to be for the subsequent five years. The actual and projected expenditures of this position are not quantified since the position caries other responsibilities previously budgeted for by the District.

IMPLEMENTATION: *The Accountant/Office Supervisor will continue to fulfill the District's needs for the management and coordination of its water conservation programs.*

5.4.13 Water Waste Prohibition

Implementation methods shall be enacting and enforcing measures prohibiting gutter flooding, sales of automatic (self regenerating) water softeners, single pass cooling systems in new connections, nonrecirculating systems in all new conveyer car wash and commercial laundry systems and non-cycling decorative water fountains. (Water Code §10631(f), 1-M)

The District has an ordinance in effect since 1983 prohibiting gutter flooding, non-recirculating systems for conveyor car washes, and non-recycling decorative water fountains. This ordinance is provided in Appendix B.

IMPLEMENTATION: *It is recommended that the ordinance prohibiting certain water wasting practices, during non-rationing periods, be amended by the Board of Directors during the term of this Plan, to include prohibiting; sales of automatic water*

softeners, single pass cooling systems and commercial laundry systems without recirculating systems. See Appendix B.

5.4.14 Ultra Low Flush (ULF) Toilet Replacement Program

*An Implementation program for replacement of existing high-water-using toilets with ultra-low-flush toilets (I. 6 gallons or less) in residential, commercial and industrial buildings shall be enacted. Such programs would be at least as effective as offering rebates of up to $100 for each replacement that would not have occurred without the rebate, or requiring the replacement at time of resale, or requiring the replacement at the time of change of service (*Water Code §10631(f-n)).

The District allows a credit of $100.00 for each ULF toilet installed by the customer. The District does not currently install or offer to install ULF toilets. This program has been in place for many years and the District's ordinance can be found in Section 3.4.4 Retrofit Credits. Actual and projected ULF toilet rebates and expenditures are provided in Table 5-8 and 5-9 respectively.

Table 5-8 Actual ULF Toilet Rebates Provided to Customers 2001-2005

	2001	2002	2003	2004	2005
# of ULF rebates	52	60	71	71	67
# of ULF direct installs	0	0	0	0	0
# of ULF CBO installs	0	0	0	0	0
Actual expenditures ($)	$5,200.00	$6,000.00	$7,100.00	$7,100.00	$6,700.00

Table 5-9 Projected ULF Toilet Rebates Provided to Customers 2005-2010

	2006	2007	2008	2009	2010
# of ULF rebates	62	62	62	62	62
# of ULF direct installs	0	0	0	0	0
# of ULF CBO installs	0	0	0	0	0
Actual expenditures ($)	$ 6,200.00	$6,200.00	$6,200.00	$6,200.00	$6,200.00

IMPLEMENTATION: *The District will continue its retrofit credit.*

6 WATER SHORTAGE CONTINGENCY PLAN

6.1 Introduction

This section presents the District's plan to manage its water supply sources in response to a water shortage emergency. Shortages in Scotts Valley are most likely to occur as a result of drought. Other potential interruptions to water supply could result from the destruction of wells by an earthquake or the loss of key production wells due to environmental contamination. Accordingly, this section considers the impact on groundwater supplies of two types of drought and two types of catastrophic interruption of water supply.

The numerical model was utilized to perform a series of scenarios reflecting drought and catastrophic supply interruptions. The model provides the flexibility of applying current demand values to drought conditions that occurred in the past or are likely to occur in the future. The numerical model also enables the user to simulate the shut down of key wells and evaluate the effect on the District's ability to supply customers.

Drought conditions were identified using a single extreme drought year where rainfall is reduced to 50% of normal, and an extended drought where the average rainfall is at less than 60% of normal for three or more years. The major implication of these conditions to the District would be: production well capacity, groundwater storage decline, and the potential loss of a well(s) if water levels drop below well production zones.

A catastrophic interruption of water supply that could occur in Scotts Valley is analyzed in the numerical model by shutting down the potentially effected wells. Given an earthquake condition the model applies the loss of two of the District's largest producing wells, #7A and #3B.

The potential for environmental contamination is most significant in the south Scotts Valley area, where recent experiences with gasoline contaminants near the District's Well #9, and chlorinated solvent contaminants near Well #10 have increased the potential for closure of a production well. The likelihood of such occurrences without prior warning has been reduced considerably through preparation and implementation of the District's Drinking Water Source Assessment and Protection Program. The District's 2004 well ordinance also provides the District with the ability to regulate activities surrounding private wells in the Scotts Valley area; however, these considerations necessitate ongoing vigilance in the area of groundwater protection and are considered in the District's Water Shortage Contingency Plan.

6.2 Coordinated Disaster Planning

In accordance with California Water code §10620(d)(2), the District has coordinated, to the extent practicable, the preparation of its urban water shortage contingency plan with other urban water suppliers and public agencies.

Basic Planning Activities

The District's water sources are owned exclusively by District.

The District neither imports nor exports water to any other agency on a regular basis. There is a small (2-inch) emergency intertie with SLVWD for emergencies arising in either district. The intertie has been used twice to date – once for flow in either direction. A Proposition 50 Security Grant Application is pending to expand this intertie.

Disaster Planning

The contingency plan is provided to the City of Scotts Valley Office of Emergency Services and will be incorporated as an active element of the Water District Emergency Operations Plan.

Public Meetings

The District considered the matter of the Contingency Plan during the course of the Public Hearing held during its meeting scheduled on December 8, 2005. The Board made its recommendation for adoption at the close of the Public Hearing on both the Contingency Plan and the Urban Water Management Plan.

6.3 Assessment of Existing Supply Reliability

Impacts of drought and catastrophe for the District are expressed in terms of water level declines in wells and the loss of storage. Figure 2-4 shows locations of wells specifically referenced in the modeling results. As previously noted in Section 2.4, "Source of Supply and Facilities," the District is underlain by the Santa Margarita Groundwater Basin. The amount of storage estimated to be in the Basin in 1998 was 266,806 AF (Todd, 1998). Storage declines as estimated by the numerical model total 8,999 AF from WY1998-2004; therefore the gross basin storage is currently estimated to be 257,807 AF. This, of course, is predicated on replenishment of groundwater during wet years and stabilization of water levels over the long term. With the large amount of storage in the Basin, the District is not concerned with the absolute availability of supply, but the impact on wells and water level declines during water supply shortages.

The assessment of the reliability of the District's groundwater supply has been evaluated previously during the development of safe yield volumes and recharge relative to

precipitation. The Basin numerical model is currently being applied to evaluate this reliability based on the redistribution of pumping centers, the expansion of the water recycling program, and potential increases in demand on the aquifer. The results of this analysis will be complete in early 2006.

6.4 Supply Reliability During Shortage

For the purpose of developing a water shortage contingency plan the model was applied to the drought and catastrophe scenarios discussed in the beginning of this chapter. The scenarios are designed to simulate water shortage emergencies under current aquifer storage, extraction volumes, and conditions as established by the numerical model. The various shortfall situations, as well as water conservation responses, were applied to WY2004 aquifer conditions. Precipitation values and recharge conditions are based on actual drought years experienced by the region based on the 57-year precipitation record. The scenarios include:

- An extreme one-year drought when rainfall is reduced to 50% of normal;
- A severe, prolonged (five-year) drought with rainfall averaging less than 60% of normal;
- The same severe, prolonged (five-year) drought with demand reduced by mandatory conservation. Mandatory conservation practices are applied on an increasing scale throughout drought progression;
- Catastrophic interruption of water supply due to the sudden loss of well #7A and #3B as the result of an earthquake;
- Catastrophic loss of water supply due to the sudden loss of Well #9 and Well #10 as a result of environmental contamination, and;
- The same catastrophic interruptions with demand reduced through emergency, mandatory water conservation.

This analysis is performed by the numerical model using current aquifer conditions and demand controlled conditions.

6.4.1 Numerical Modeling Results

The results of the model scenarios are used to provide background data for basin management and response criteria. Considering the large volume of stored groundwater in the Basin, the ability to access the water resource in a drought or catastrophe situation is of particular concern. A secondary consideration is the long-term impact on the groundwater

basin, specifically loss of storage. The details regarding these modeling scenarios are provided in Appendix D.

Drought Scenarios

The results of these model scenarios are used to assess the ability of wells to continue producing water during drought conditions and to identify the concurrent storage losses to the basin that occur.

Scenario #1: 1-year drought with precipitation <50% of normal:

This scenario was run, using the most severe drought on record (WY1990). The 1990 precipitation was 49% of average for the Scotts Valley area and represents a 50% reduction in supply for the District. The model is run for a one year period under WY2004 operating conditions (i.e. extraction rates, current aquifer storage, and existing formation water levels).

Throughout the model run all District wells were able to sustain 2004 pumping rates with no significant loss of capacity realized. However, the total loss in storage for the groundwater basin over the duration of the model run was calculated to be 3,670 AF. This is significantly larger than the 1,925 AFY average discussed in Chapter 2.

Scenario #2: 5-year drought with precipitation <60% of normal:

Similar to the previous scenario, this scenario uses WY2004 values to represent aquifer conditions and extraction rates. The precipitation values are based on the most severe consecutive drought from the available record. Although water code *§10632 (b)* requires a three-year drought sequence, a five-year scenario was used for this run. The available historical record indicates a five-year drought occurring between WY1987 and WY1991, and includes the "*driest three-year historic sequence for the agency's water supply*". Therefore it is still in accordance with *§10632 (b)*. In order to simulate a realistic drought condition, data from this five-year period were input into the model.

Throughout this model scenario, declining water levels in the South Scotts Valley subbasin led to the dewatering of the District's production Well #9. Other District wells were able to continue producing at 2004 extraction rates throughout the five-year model run. Well #9 production was measured at 44AF in WY2004, approximately 2.2% of the District's 2004 production. Groundwater storage declines during the scenario averaged 1,781 AFY, resulting in a total loss in storage within the groundwater basin of 8,904 AF over the period of the model run.

Scenario #3: 5-year drought with precipitation <60% of normal and gradually increased demand reduction:

This model scenario is identical to scenario #2, with the exception that extraction rates used throughout the model run are gradually decreased to simulate mandatory water conservation measures. This progressive decrease in well production is only applied to District wells since the District can only mandate such reductions in wells which it owns. The reduction in pumping follows the stages of action described in later sections, and is as follows:

- Drought year 1 – no reduction in pumping
- Drought year 2 – 10% reduction in pumping
- Drought year 3 – 15% reduction in pumping
- Drought year 4 – 15% reduction in pumping
- Drought year 5 – 20% reduction in pumping

The results from this scenario are similar to that of the previous scenario, where the District's Well #9 dewaters, thus reducing the available production capability. As Well #9 represents only 2.2% of the District's production in WY2004; this loss of production can be offset through additional pumping from other district wells with capacity still available under their maximum pumping rates. The average storage loss over the five-year scenario is approximately 1,670 AFY, compared to 1,780 AFY for the same drought without mandatory conservation measures. The predicted loss of storage within the groundwater basin at the end of this drought scenario was approximately 8,370 AF.

Catastrophe Scenarios

Scenario #4: Catastrophic interruption of supply resulting from environmental contamination:

This model scenario is simulated using WY2004 aquifer conditions as before. Average precipitation and recharge conditions are applied to this scenario based on the 20 years of available data in the model. The same WY2004 groundwater extraction rates from District wells are used, but are distributed to only four of the six operating wells. Well #9 and Well #10 are considered inoperable for the first six months of this one-year scenario as a result of environmental contamination. The remaining wells are pumped at elevated production rates, within their capacity limitations, for the six month period of contamination. For the second half of the model run, the wells are returned to service and extraction rates are returned to 2004 volumes for each well.

Throughout the model run, no production capacity is lost, as additional pumping capacity provided by the non-impacted District wells is adequate to replace supply lost from Well #9 and Well #10. Water levels in the remaining wells allow these wells to continue to operate at increased demand capacity. The predicted loss in storage within the groundwater basin over the course of the one year model run is approximately 1,280 AF.

Scenario #5: Catastrophic interruption of supply resulting from earthquake:

Similar to model scenario #4, this scenario is simulated using WY2004 aquifer conditions with average precipitation and recharge conditions. The catastrophic condition in this scenario removes Well #3B and Well #7A from service, which represents 50% of the total water supply in accordance with water code *§10632 (a)*. In this scenario, the remaining wells in service lack the capacity to compensate for the lost production of Well #3B and Well #7A. Therefore the well extraction rates are input to the scenario at maximum capacity for six months. The wells are capable of producing 85% of the WY2004 production volume over the same six month period. At the end of six months, each well is returned to its respective extraction rate for the remainder of the one year scenario.

In this scenario, production is already reduced by 15% due to the limited production capacity from the wells that remain online during the catastrophic event. Well #11A and #11B are capable of sustaining a maximum pumping rate for the duration of the six month catastrophic loss of water supply. Well #9 dewaters within the first three months of this scenario, resulting in an additional 6% loss of production. The total loss of storage over the course of the year within the Basin is estimated at 1,060 AF.

Scenario #6: Catastrophic interruption of supply resulting from earthquake with reduction in demand:

This scenario is identical to model scenario #5, with the exception of extraction rates for wells remaining in service during the six month interruption of service. For this scenario, the assumption is made that the loss of these two wells would necessitate a mandatory 20% reduction in water use by District customers. The 20% reduction is applied to the remaining wells in service, which have the pumping capacity to compensate for the loss of production from Wells #3B and #7A.

The total loss of storage within the Basin over the course of the water year is 1,010 AF. This change in storage is approximately 50 AF less than the previous scenario #5 (no reduction in pumping), and reflects a distribution of pumping amongst the District-owned wells that allows for the demand for the full water year, after being reduced by 20%, to be met through the catastrophic loss of two District pumping wells.

6.5 Implications for Water Management

Drought Scenarios

The most significant impact of the drought scenarios is the increased loss of storage predicted during particular scenarios and the dewatering of Well #9. These scenarios address water code *§10632 (b)* by presenting the minimum water supply available over the next five years. The model scenarios were performed using the driest five year sequence, which also includes the driest three year sequence as required by the water code. Overall, the District has the storage capacity and production ability to withstand drought conditions as defined by water code *§10632 (b).* The sustainable yield value for the Basin is based on a water balance approach of the Basin including the three driest year sequence, as shown in Table 6-1 the minimum water supply available to the District would be the sustainable yield (4200 AFY) minus the other demand existing in the basin (1982 AFY).

Table 6-1 Estimate of Minimum Supply for Next Three Years

Source	Normal Water Year	Minimum Supply (AFY)		
		Year 1 (Based on WY1987)	Year 2 (1988)	Year 3 (1989)
Santa Margarita Groundwater Basin	2248	2248	2248	2248

However, the impact to groundwater storage conditions within the Basin exceeds baseline conditions without a drought. These and other implications for the District are described below:

- During a severe one year drought, operations to the District will not be affected although declines in groundwater storage are large relative to existing conditions. Water conservation efforts should continue. The District will closely monitor precipitation throughout the following year to identify the potential for an extended drought.

- The five year drought scenario produces a predicted decline in production with the dewatering of Well #9. Although this well is not a large producer of water for the District, the production from this well will need to be redistributed to other District wells, thus decreasing water levels in the vicinity of other wells further. The most significant implication of this scenario is the overall 5-year cumulative loss in

groundwater basin storage of 8,904 AF, and the potential to reduce production capabilities of the District in the future.

- The third model scenario applies a graduated reduction in demand as a drought progresses. Since it is impossible to predict the duration of a drought, the graduated scenario reflects management efforts to control demand before a drought becomes extreme. The reduction in demand mitigates the predicted groundwater basin storage decline by as much as 538 AF, although Well #9 continues to dewater during this scenario. Therefore a relatively small volume of groundwater production will have to be redistributed to other wells as before.

Catastrophe Scenarios

These scenarios present a "worst-case" scenario for the District including a 50% reduction in supply as the result of an earthquake in accordance with water code *§1632 (a)*. The loss of production capability is significant in these scenarios and presents the District with difficult management decisions. The predicted loss of storage for these scenarios ranges from 1,015 AF to 1,280 AF for the full water year, during which the catastrophic loss of production from two District wells is simulated during the first 6 months of the water year.

- The loss of Well #9 and Well #10 as the result of environmental contamination does not reduce overall production capacity of the District, although it does increase water level declines in the compensating production wells.

- Catastrophic interruption of Well #3B and Well #7A results in water level declines in the production wells that remain in service after the catastrophe, as well as an inability to maintain WY2004 extraction rates. Production is reduced by 15% with the loss of these two wells. As the other wells are forced to compensate to their full capacity, Well #9 dewaters, further reducing the production capabilities of the District by an additional 6%. Without any demand reduction measures, the District would not adequately supply its customers.

- By imposing a mandatory 20% reduction in demand, the District is able to sufficiently supply its customers with water until the wells can be replaced or repaired in Scenario 6. The results of the modeling effort indicate that pumping would need to be distributed unevenly throughout the well fields. Specifically Well #11B is required to carry most of the burden in order to prevent the dewatering of Well #9 or Well #10. If full production cannot be restored in six months, the declines in water levels in active wells would be greater, and the ability of the District to continue meeting demand is unknown. Accordingly, it would be practical to implement strict conservation measures in a timely manner in the event of a catastrophic disruption of well service as simulated in this scenario.

6.6 Response to a Water Supply Shortage

This section describes the District's response to potential water supply shortages, including drought and catastrophic loss of water supply sources. The District's response to a water supply shortage involves three stages of action. The criteria developed for each stage of action are supported by the output from the modeling scenarios presented above. The reduction in demand has been quantified by magnitude of each water supply shortage event. As it is impractical to predict the actual events leading to a water shortage, the model scenarios were designed around the most likely to occur.

Regional power outages also represent a potential interruption in water supply, but not a catastrophic event because the District has generators capable of running wells, booster stations, and treatment facilities.

6.6.1 Preparation for a Water Supply Shortage

In preparation for a water supply shortage, the District has taken or is taking the following actions:

- Stages of action for water supply shortage and catastrophic water supply interruption have been defined in subsection 6.7.
- A water shortage contingency resolution has been drafted for use in response to water shortage (Appendix C).
- The District is currently drafting two ordinances. The first of these will regulate the number of new service commitments and connections granted during a water shortage and the second expands the prohibitions on wasteful water practices that were established by ordinance No. 74-83 (See Appendix C).

This water shortage contingency plan, including appendices, has been provided in both draft and final form to other local agencies and interested parties (see Table 1-2). It has been provided to the City of Scotts Valley Office of Emergency Services and is incorporated as an addendum and active element of the Water District's *Emergency Response Plan (December 2004)*.

6.7 Stages of Action

Stages of action for many water agencies are defined by available storage in a surface water reservoir or by the annual allotment provided by a water wholesaler. The District's distinction from these other agencies is the considerable groundwater storage which the District overlies. The amount of storage enables the District to endure periods of drought without a drastic shortfall in supply. Regardless of the storage capability of the aquifer, the District implements water rationing practices during such conditions to protect the health of the aquifer and ensure acceptable well production rates.

The amount of rainfall in a given year or series of years is the recommended basis for defining the stages of action. Rainfall, the ultimate source of recharge to the Basin, is readily monitored and is recognized as the basis for defining drought. During a shortfall in annual rain, the District could take the appropriate response, such as mandating conservation near the beginning of the high demand period when such actions are most likely to have a positive impact on water supplies.

The District's response to a water supply shortage will depend on the magnitude of the shortfall. The following table defines critical water supply shortage stages that would trigger associated conservation measures. These stages of action are based on results of the numerical model in support of the overall management of the Basin.

Table 6-2 Water Supply Shortage Stages of Action and Conditions

STAGE	Water Supply Condition	Mandatory Conservation (Rationing)
Stage One	<60% of average rainfall for two consecutive years.	10% demand reduction
Stage Two	**Any one of the following:**	15% demand reduction
	<60% of average rainfall over 3 consecutive years	
	<50% of average rainfall for more than one year	
Stage Three	**Any one of the following:**	20% demand reduction
	<60% of average rainfall over 4 consecutive years	
	Catastrophic loss of 50% of well capacity	

Stage one is defined as a precipitation shortfall for two consecutive years. The demand reduction of 10% reflects the District's proactive approach to addressing the possibility of an extended drought. The 10% reduction decreases the loss of storage associated with a two year drought, and raises public awareness of drought conditions. By raising public awareness, additional voluntary conservation by customers is more likely, and further demand reduction increases, if needed, will not be unexpected.

Stage two occurs when the District is in its third year of a drought with average precipitation less than 60% of normal, or its second year of precipitation less than 50% of normal. Stage two is defined by a 15% mandatory demand reduction. This is also a proactive measure to decrease the loss in storage in the aquifer and ensure a stable demand for the District.

A stage three condition represents emergency conditions in the District which would occur as the result of a five year extended drought with precipitation averaging less than 60% of normal or a loss of 50% of pumping capacity from the production wells. This stage would trigger a 20% mandatory reduction in consumption from customers. Although this is a steep reduction, it is necessary to ensure a continuous water supply in the event of a catastrophe. Although the 20% reduction is not absolutely necessary during an extended drought to ensure a continuous water supply, it represents the level of conservation required to protect the health of the aquifer and ensure a water supply for the future.

It should be noted that water shortages in Scotts Valley may not need to be addressed solely through water conservation; for instance, potable demand reduction might also be accomplished by transfer of local groundwater producers to recycled water use for landscaping needs.

The potential for demand reduction in the District will decrease as more landscape irrigation users convert to recycled water, because potable landscape users represent the greatest potential for conservation in a crisis. This is considered a demand hardening situation. If this were to occur, a four year drought might justify a 15% demand reduction instead of a 20% reduction while other alternatives are investigated.

In the scenario simulating a catastrophe, the 20% mandatory conservation measure will adhere since the District is currently capable of providing only 80% of its supply from existing wells. Although this is often considered an unrealistic percentage, the modeling exercise is only intended to simulate the interruption of service for six months under normal aquifer and precipitation conditions.

In the event of a larger catastrophe, or if an extended interruption of service were to occur during the peak summer months under abnormal aquifer conditions, the overall loss of capacity would be larger than the 50% reduction outlined in water code §10632(a). Under these circumstances, the General Manger of the District, with the approval of the Board of Directors, would increase the mandatory demand management measures outlined in the stages of action to accommodate this specific scenario. These emergency management measures are not necessarily limited to those documented in this plan and may include prohibiting all water use except for basic drinking, cooking, and necessary human hygiene.

6.7.1 Mandatory Prohibitions Against Water Waste

Waste of water is always prohibited by the District, as documented in the Water Conservation Regulations originally adopted in 1983 (see Appendix C). The adopted Ordinance No. 74-83 identifies water as a finite resource and strictly prohibits its waste. Specifically prohibited water uses are listed in Table 6-3.

Table 6-3 Mandatory Prohibitions

Prohibition	Stage When Prohibition Becomes Mandatory
Unauthorized use of water from any fire hydrant	All Stages
Landscape irrigation that allows excess water to run to waste	All Stages
Uncorrected plumbing leaks, breaks, or malfunctions	All Stages
Use of water for washing cars, boats, sidewalks, driveways, or other exterior surfaces without a quick-acting shut-off nozzle on the hose	All Stages
Operation of any ornamental fountain or car washes unless the water is recirculated	All Stages

Although these regulations are permanent, it is anticipated that the number of reports of water waste received from the general public and field staff will increase dramatically during times of water shortage. The penalty for violation or non-compliance is disconnection of water service 48 hours after a written notice of the customer's non-compliance. Water service will be reinstated under the terms and conditions of District Ordinances.

6.7.2 Consumption Reduction Measures

Once a water shortage stage has been declared, measures will be implemented to meet water conservation goals. This section describes consumption reduction methods that may be implemented by the District in response to water shortages. It is important to recognize that the following are guidelines. The District's actual response to a water shortage emergency will require specific action by the Board of Directors. Nothing in this plan is intended to limit the District's available options in defining a specific response to any future water shortage.

An important measure to implement during shortages is the regulation of new water connections. The District is currently drafting an ordinance to address this issue. The District will provide suggested water saving measures to its customers. Water conservation measures should be directed toward conserving potable water supplies. Use of recycled water need not be curtailed, although waste is never encouraged. Table 6-4 outlines reduction measures to be taken by the District during different stages of action.

Table 6-4 Consumption Reduction Methods

Consumption Reduction Measures	Stage When Method Takes Effect
Notification of all customers of the water shortage	All Stages
Water shortage pricing	Ongoing Programs
Provision of technical information to customers on means to promote water use efficiency	All Stages
Development of a media campaign to promote water conservation	Stage 2, Stage 3
Covering pools and hot tubs when not in use	All Stages
Development or expansion of efficiency programs such as toilet rebates	Ongoing Program
Voluntary restrictions	Stage 1
Mandatory restrictions	Stage 2, Stage 3
Sweeping of paved areas instead of washing down with potable water	All Stages
Display by restaurants and hotels of water conservation signs	All Stages
Restaurant serving of water to patrons only upon request	Stage 3
Per capita allotment by customer type	Stage 3
Use of recycled water for irrigation whenever possible.	Ongoing Program
Regulation of construction water use.	Stage 3

6.7.3 Prohibitions and Penalties

The response of customers to the methods listed in Table 6-4 is assessed by District staff and penalties are enforced appropriately. Table 6-5 list penalties associated with non-compliance during various stages of action.

Table 6-5 Penalties and Charges During Water Shortages

Penalties During Water Shortage	Stage When Penalty Takes Effect
Educational Letter, visit by service representative	Stage1
Written Warnings	All Stages
Excess Use Penalties	Stage 2, Stage 3
Disconnection of Service*	All Stages

*Disconnection of service occurs only when customers are in violation of Ordinance 74-83.

Written warnings are distributed to all customers prior to excess use fees or disconnection of service. Excess use fees charged to customers are determined by the General Manager of the District after approval of the Board of Directors. Excess use fees will be in response to mandatory conservation practices enacted by the District during the second and third stage of action.

6.7.4 Revenue and Expenditure Impacts

Successful implementation of water conservation measures results in a decrease in water demand, with the unintended effect of reducing a water purveyor's revenues. Accordingly, the water code requires analysis of fiscal impacts of the water shortage contingency plan on revenues and expenditure, and discussion of measures to reduce impacts.

For the District, effective implementation of the Water Shortage Contingency Plan would result in a decline in potable water sales by as much as 10 to 20 percent in terms of numbers of gallons of demand. Because of the steep tiers for usage charges, the impacts on revenues would be even greater. In addition, recycled water sales during a water shortage could also decline slightly, reflecting the community's overall reaction to the water shortage. This impact could be minimized through public information. Revenues from connection fees would also decline, but only if a moratorium were placed on new service connections during the water shortage.

Revenues derived from penalties for excessive water use or water wasting during the water shortage would not effectively offset lost revenues. These presumably limited revenues should be applied toward administration of the water shortage contingency plan.

Declining water demands would be offset to a small degree by a decline in operating expenses related to the amount of water provided, such as pumping (energy) and water treatment chemicals. Nonetheless, to offset short-term revenue decline without raising water rates, the District would need to rely on financial reserves and/or decrease its expenditures. A decrease in expenditures could entail deferring planned capital improvements.

6.7.5 Reduction Measuring Mechanisms

The Urban Water Management Planning Act requires a mechanism for determining if reductions in water use are actually being achieved in response to conservation measures. The draft ordinance prohibiting water waste charges the District's General Manager with implementation and administration of the ordinance. Enforcement of the ordinance to minimize violations will be a key part of this administration.

Regular monitoring during a Stage 1, Stage 2, or Stage 3 shortage would include reporting of daily production figures to the General Manager. In addition, water usage by customers from bimonthly billings would be reported to the General Manager. The General Manager

would provide a monthly status report to the District Board on the status and effectiveness of the conservation program. If reduction goals are not met, the General Manager would inform the District Board so that corrective action can be taken in a timely manner.

References

Association of Monterey Bay Area Governments, 2004, *AMBAG Population, Housing Unit, and Employment Forecasts,* public document.

Association of Monterey Bay Area Governments, August, 2005, *Scotts Valley Water District, Boundary Specific Population Projections*, report to ETIC Engineering, Inc.

California Department of Water Resources, 2003, *DWR Bulletin 118*: *California's Groundwater.* public document.

California Department of Water Resources, August 1994, *Bulletin 166-4: Urban Water Use in California,* public document.

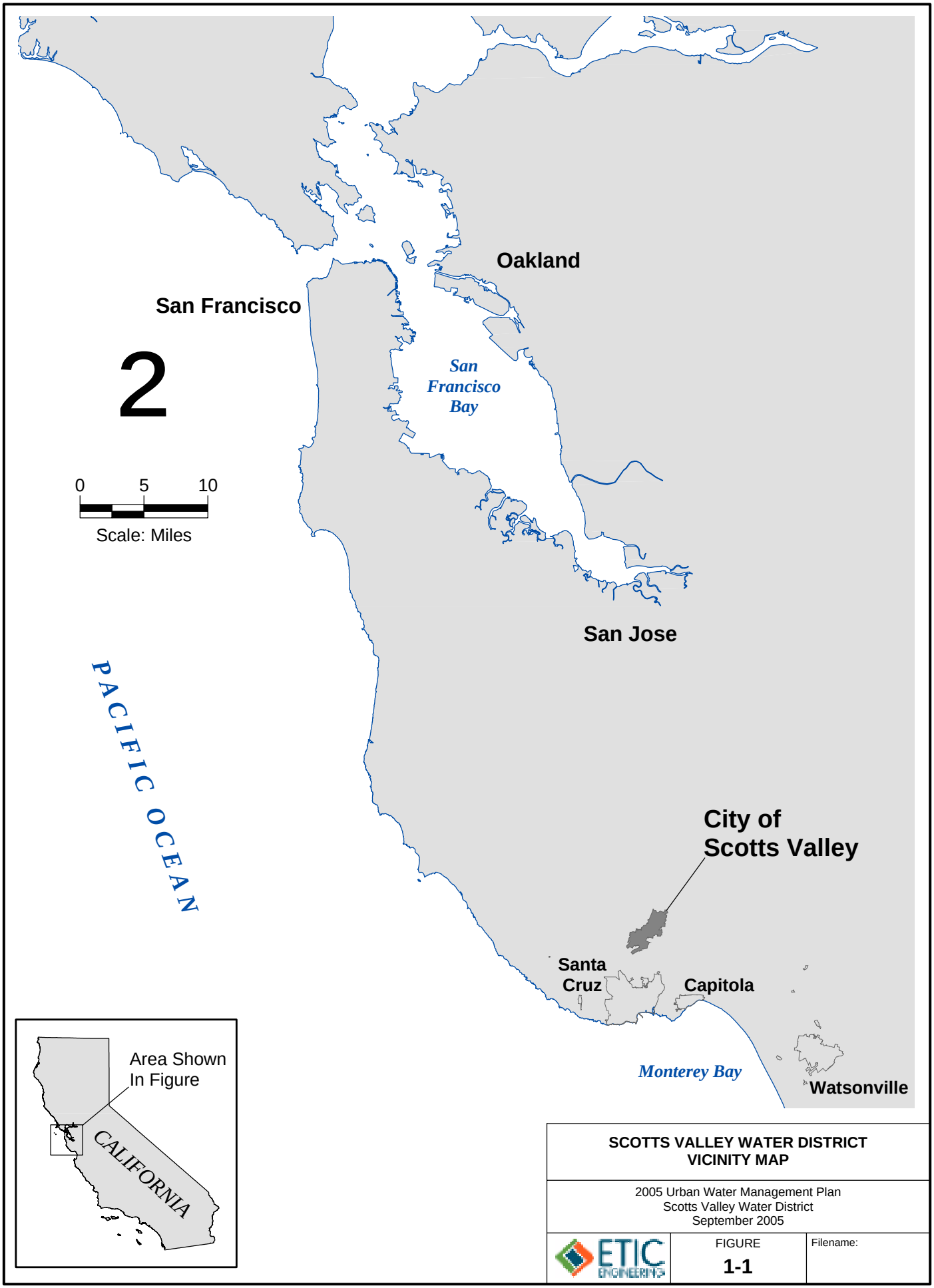
City of Scotts Valley Planning, 2005, *Housing Element (revised)*, public document.

ETIC Engineering Inc., June 2005, *Scotts Valley Water District Groundwater Management Program – 2003-2004 Annual Report*, report to Scotts Valley Water District.

Todd Engineers, 1994, *Scotts Valley Water District Groundwater Management Plan (AB3030)*, report to Scotts Valley Water District.

Todd Engineers, 1998, *Reevaluation of the Water Balance*, report to Scotts Valley Water District.

FIGURES



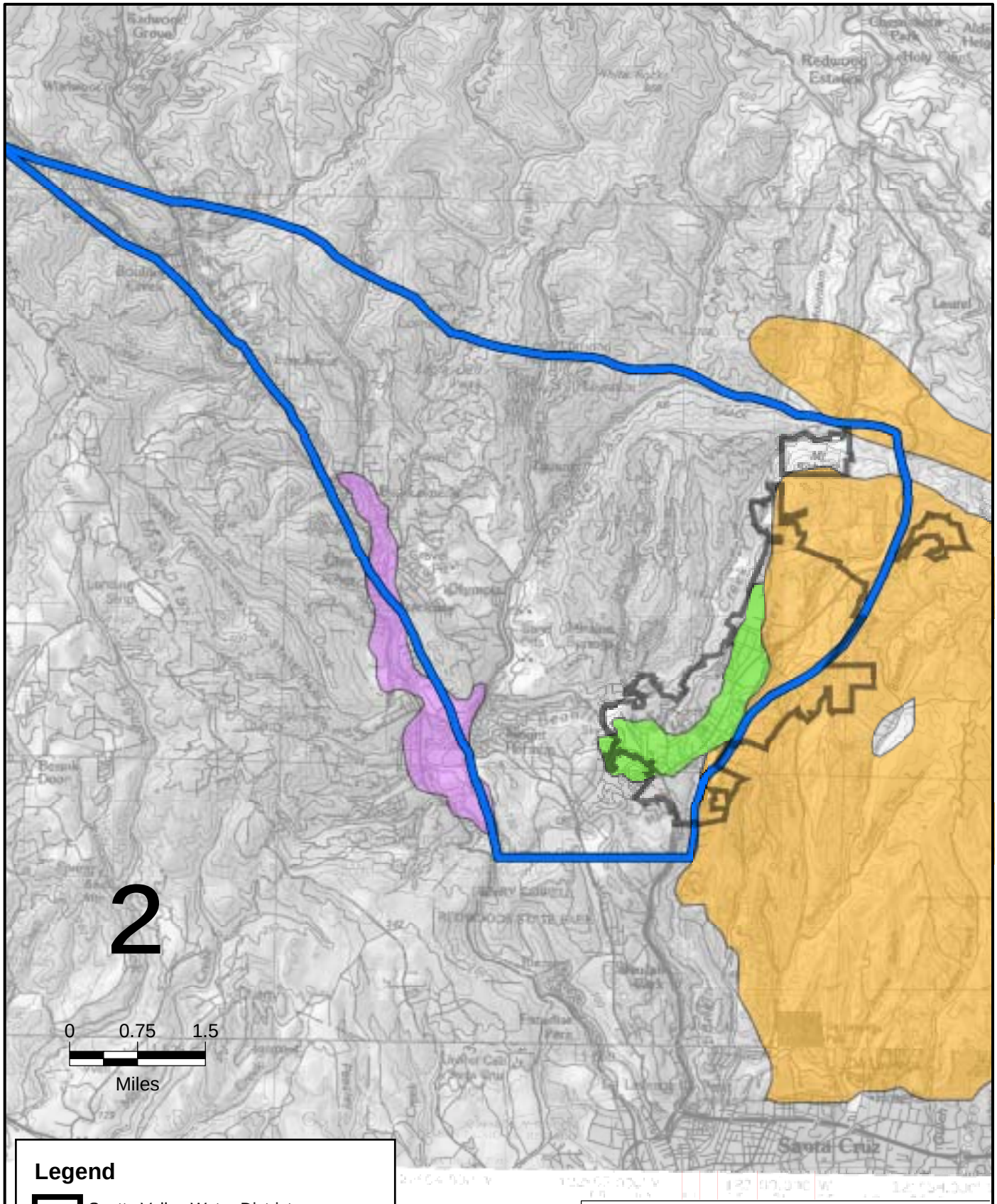
SCOTTS VALLEY WATER DISTRICT
VICINITY MAP

2005 Urban Water Management Plan
Scotts Valley Water District
September 2005

ETIC ENGINEERING

FIGURE
1-1

Filename:



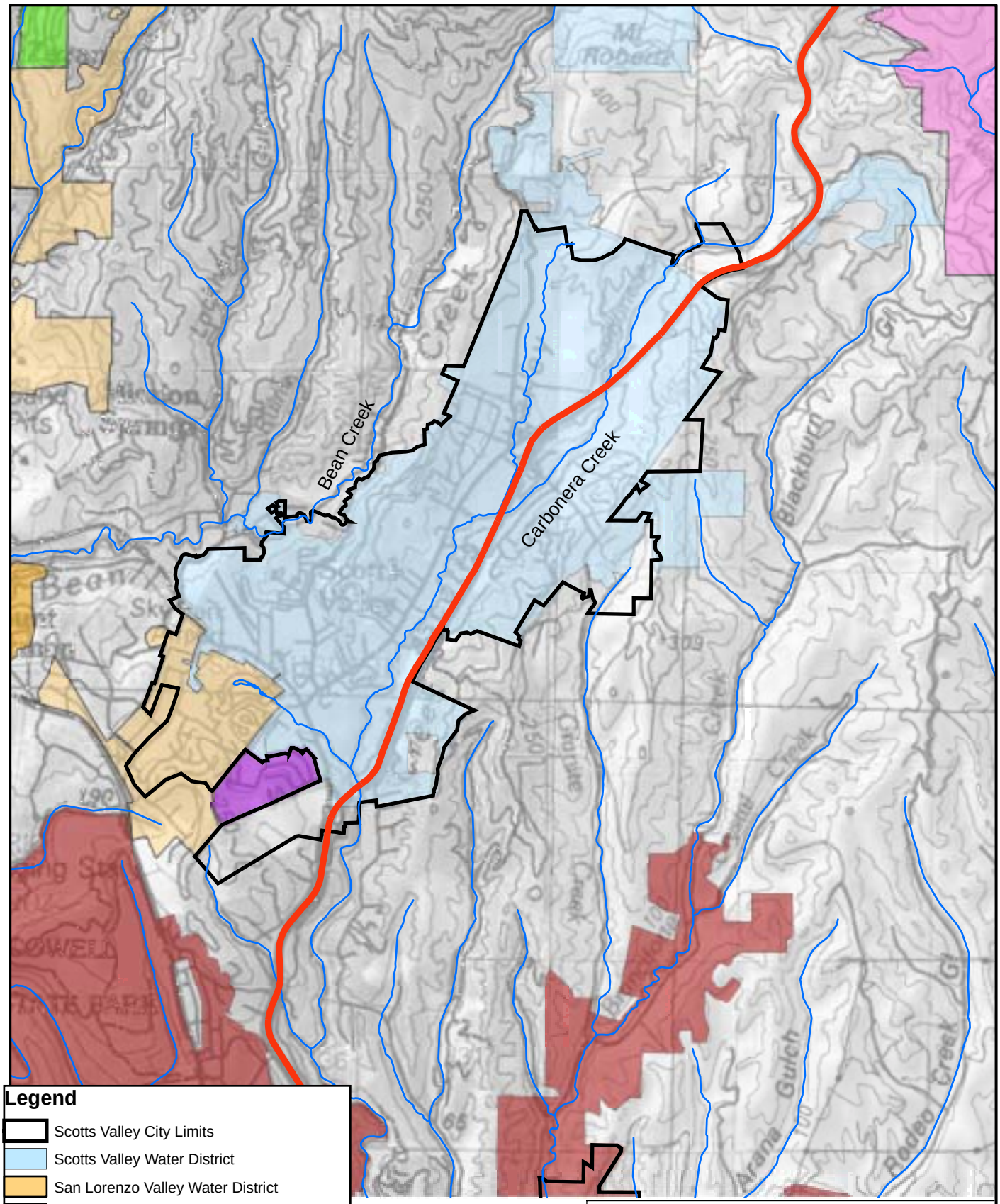
Scotts Valley Water District and Associated Groundwater Basins

2005 Urban Water Management Plan
Scotts Valley Water District
September 2005

ETIC ENGINEERING

FIGURE
2-1

Filename:



2

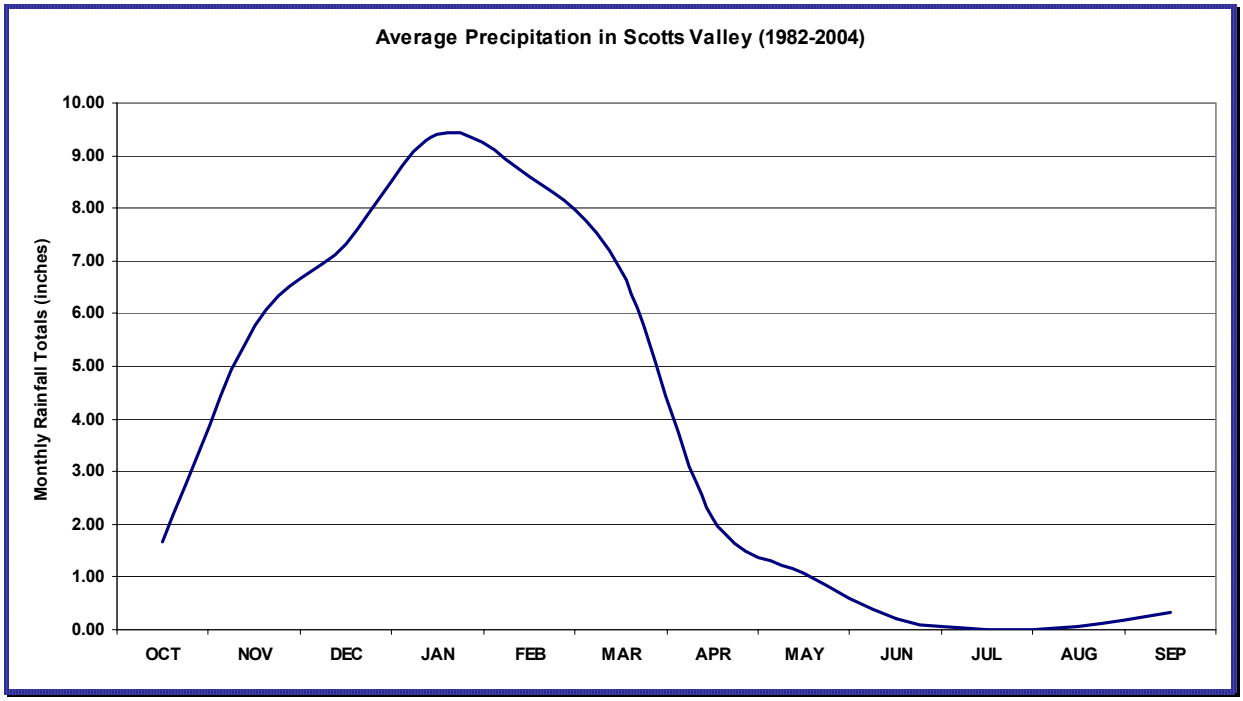
Scotts Velley Water District and Surrounding Water Suppliers

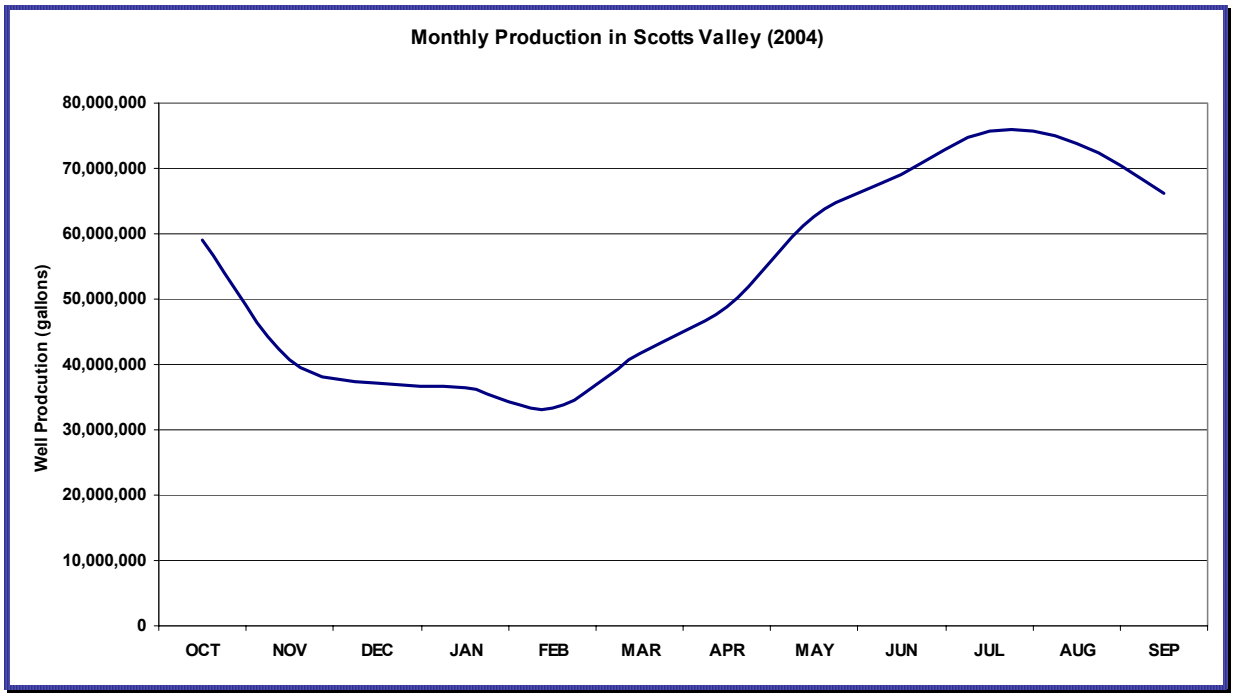
2005 Urban Water Manageent Plan
Scotts Valey Water District
September 2005

ETIC ENGINEERING

FIGURE
2-2

Filename:





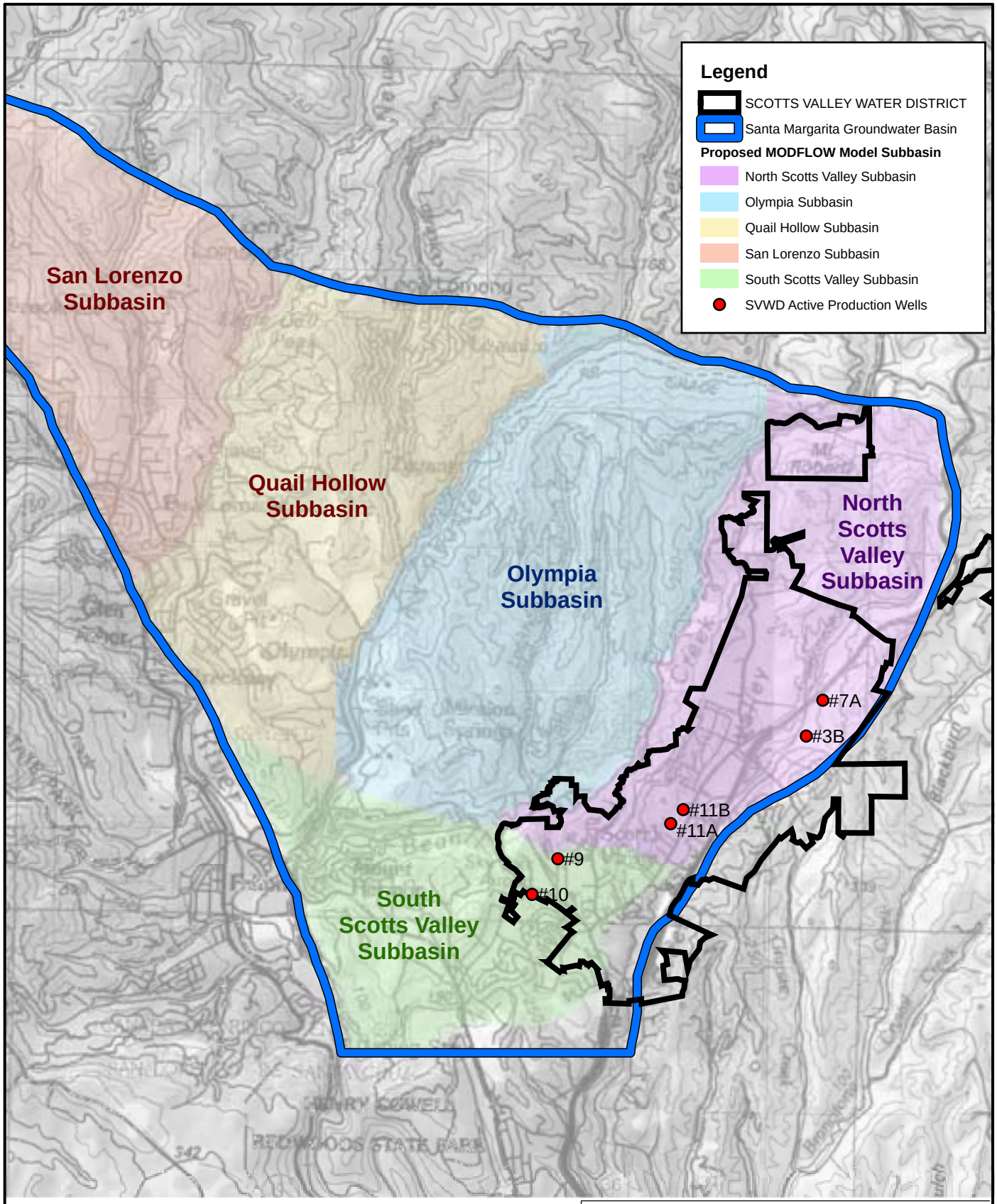
Comparison of Historical Groundwater Production Demand and Precipitation

2005 Urban Water Management Plan
Scotts Valley water District
September 2005

ETIC ENGINEERING

FIGURE
2-3

Filename:



2

0 0.5 1

Scale: Miles

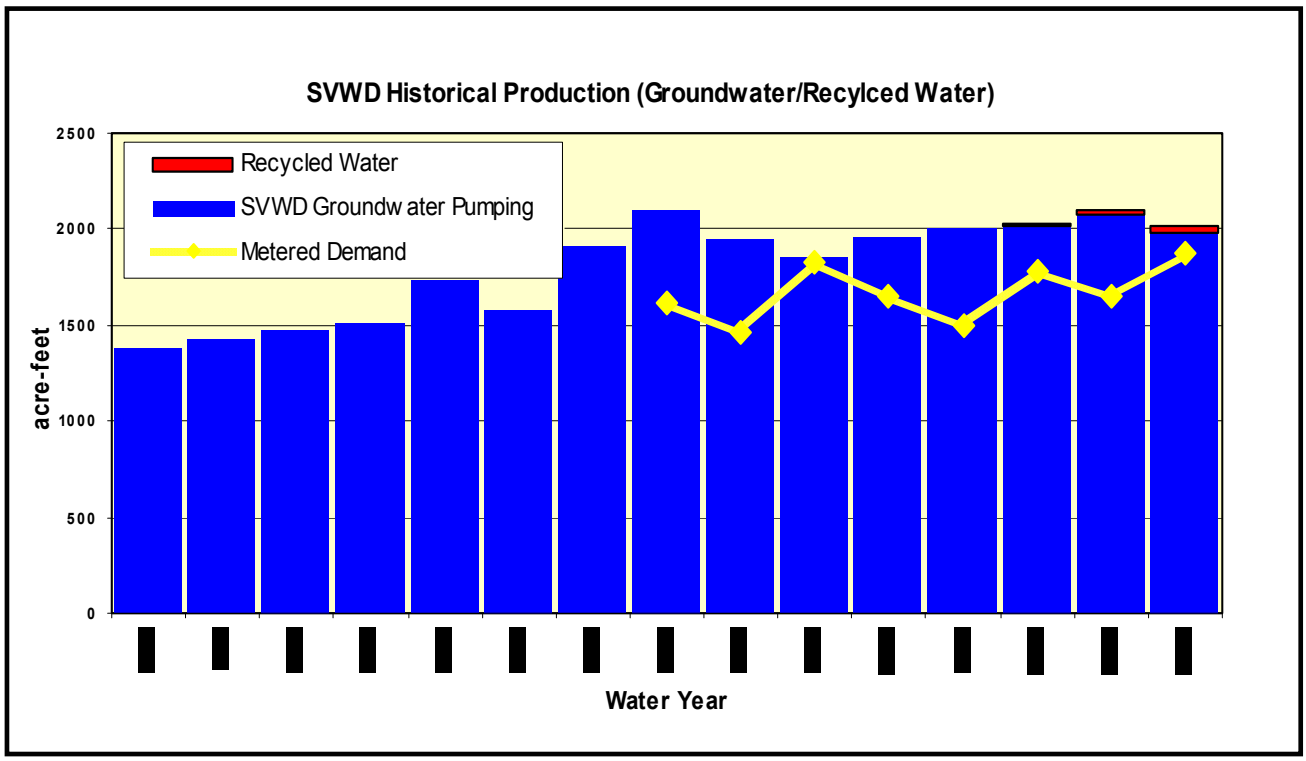
Santa Margarita Groundwater Basin and Associated Sub-basins

2005 Urban Water Management Plan
Scotts Valley Water District
September 2005

ETIC ENGINEERING

FIGURE **2-4**

Filename:



Scotts Valley Water District Historical Production and Demand

2005 Urban Water Management Plan
Scotts Valley water District
September 2005

ETIC ENGINEERING

FIGURE
3-1

Filename:

APPENDIX A

COMMENTS

Appendix A
COMMENTS ON THE
SCOTTS VALLEY WATER DISTRICT DRAFT 2005 URBAN WATER MANAGEMENT
AND WATER SHORTAGE CONTINGENCY PLAN
Submitted by Mike Cloud and John Ricker, Santa Cruz County Environmental Health Services

Table 2-3 – It would be helpful to evaluate water consumption and areas for possible conservation savings if the table also included the percentage of total water produced by SVWD that is served to each customer type

RESPONSE: ADDED COLUMN IN TABLE 2-3.

Section 2.4.1 – From the reading of this section one might infer that it was the SVWD and its consultant who 'enhanced' the understanding of the basin hydrogeologic conditions. It should be noted that the older model deficiency and a more accurate alternate model were proposed as part of the collaborative efforts of the SMGBAC technical group. The AB303 work just confirmed and refined this newer interpretation. County staff would like to emphasize this point because it was due to the District's willingness to work cooperatively with other stakeholders on the basin's groundwater problems that these important issues were finally resolved.

RESPONSE: ADDED TEXT PAGE 13 DETAILING SMGBAC EFFORTS IN REINTERPRETATION OF THE BASIN.

Sections 2.4.2,3,4 – The discussions of total basin storage, average annual storage loss, current groundwater pumping, and sustainable yield is likely to confuse the non-technical readers of this report. One might wonder how a basin with 266,806 acre-feet (AF) of total storage can be annually over-drafted by 1,965 AF by pumping 3,078 AF, while the basin sustainable yield is determined to be 4,200 AF per year. The report should clarify how and why the basin pumping is causing this imbalance. The report should also focus on storage, yield, and supply imbalance specifically in the part of the basin which the Scotts Valley Water District utilizes.

RESPONSE: ADDED TEXT PAGES 15-16.

Staff understands that the current modeling effort determined an average basin sustainable yield of 3,300 AF per year. Why was this newer yield number not used in this report?

RESPONSE: ADDED TEXT PAGES 15-16.

Also, staff did not see a discussion of how or if the basin can be brought into hydrologic balance though the redistribution of pumping, additional TTWW use, or enhanced groundwater recharge. Since the projections of future demands on the system are dependent on achieving a hydrologic balance, this would seem like an appropriate place in the report to address the water balance issue.

RESPONSE: ADDED TEXT PAGES 16.

Section 2.5 – Considering that the District overlies between 15 to 20 percent of the groundwater basin and essentially only 2 of the 5 delineated sub-basins, it is unclear how the District will have access to sufficient quantities of groundwater in the future while an average storage decline of 2,000 AFY is occurring. Additionally, as the report has indicated, the ultimate source of recharge to the aquifer comes from precipitation. However, development as is currently practiced in the Scotts Valley area prevents

precipitation from recharging the aquifer. Therefore, won't the future recharge rates be less than current rates and impact the water balance?

RESPONSE: THE STORAGE DECLINES OF 1925 AFY REPRESENT AN AVERAGE ANNUAL STORAGE LOSS FOR THE ENTIRE BASIN RELATED TO THE OVERALL STORAGE CAPACITY OF THE BASIN FOR THE PERIOD BETWEEN WY1984-WY2004. TO ACCURATELY ESTABLISH A VOLUME ASSOCIATED WITH THE PORTION OF THE BASIN THE DISTRICT OVERLIES REQUIRES AN ADDITIONAL STUDY THAT IS OUT OF THE SCOPE OF THIS DOCUMENT. THE PURPOSE OF THIS SECTION OF THE DOCUMENT IS TO IDENTIFY THE ULTIMATE SOURCE OF WATER TO THE DISTRICT, WHICH IS PRECIPITATION.
THE INCREASED DEVELOPMENT IN THE SCOTTS VALLEY AREA WILL MOST LIKELY LEAD TO LESS PERMEABLE AREA AND LESS RECHARGE TO THE BASIN. THIS DECREASE IN RECHARGE RATES IS CONSIDERED MINIMAL AND NOT QUANTIFIABLE CONSIDERING THAT NEW DEVELOPMENT LOCATIONS ARE YET TO BE DETERMINED AND THEREFORE CANNOT BE ACCURATELY PREDICTED. ADDITIONALLY, SCOTTS VALLEY IS APPROACHING ITS BUILDOUT; MOST OF THE INCREASE IN DEMAND IS PROJECTED TO COME FROM AN INCREASE OF MULTIFAMILY UNITS RESULTING FROM REDEVELOPMENT OF EXISTING DEVELOPMENT. THIS TYPE OF DEVELOPMENT DECREASES THE PROPORTION OF LAND USED RELATIVE TO THE INCREASE IN DEMAND.

Section 3.2 – What impact to the computed basin water balance does the inaccuracy of the well meters have? For example, if the current imbalance has been caused by an incrementally smaller pumping volume, doesn't that impact calculations of the aquifer transmissivity and storage?

RESPONSE: DURING THE SEVEN YEARS FOR WHICH DATA IS AVAILABLE TO COMPARE DEMAND VOLUMES TO PUMPING VOLUMES, THE POTENTIAL INACCURACIES ASSOCIATED WITH DISTRICT WELL METERS REPRESENT UP TO 10% OF TOTAL ANNUAL GROUNDWATER EXTRACTIONS FOR THE ENTIRE BASIN.
THE POTENTIAL VARIABILITY ASSOCIATED WITH ALL NUMERICAL MODEL INPUT PARAMETERS (MUNICIPAL PUMPING RATES, PRIVATE USER PUMPING RATES, RECHARGE RATES, STREAMFLOW RATES, TRANSMISSIVITY, STORATIVITY, ETC) IS ADDRESSED THROUGH ADJUSTMENT OF THESE INPUT PARAMETERS ACROSS REASONABLE RANGES DURING THE CALIBRATION PROCESS. CALIBRATION OF THE NUMERICAL MODEL THROUGH COMPARISONS TO MEASURED GROUNDWATER ELEVATIONS AND GRADIENTS ENSURES THE ABILITY OF THE MODEL TO SIMULATE CHANGES IN GROUNDWATER ELEVATIONS AND STORAGE IN RESPONSE TO CHANGES IN EXTRACTION RATES AND OTHER INPUT PARAMETERS.
AS IS TYPICAL FOR THE DEVELOPMENT OF A NUMERICAL MODEL, THE SENSITIVITY OF MODEL OUTPUT IS DOCUMENTED TO ENSURE RESULTS ARE RELIABLE ACROSS THE RANGE INPUT PARAMETER VARIABILITY. PRIOR TO APPLICATION OF THE MODEL TO OTHER PREDICTIVE SCENARIOS, MODEL RUNS CAN BE PERFORMED TO ASSES THE SIGNIFICANCE OF ANY INACCURACIES IDENTIFIED WITHIN THE HISTORICAL FLOW METER DATA.

Table 3-1 – Review of this table without of the context of what was described in Section 2.4.2 gives the reader the impression that there is plenty of groundwater available to meet current and future needs. Again, why is the 4,200 AFY number being used here? If the yield from the whole basin is used in this table, other uses from the entire basin should be accurately reflected, including some projection for increase in "Other Demand". This table implies that there is excess water available, when in fact groundwater storage in the basin has been declining at an average of 2000 AFY. It is also unclear where the projected figures for recycled water use to offset projected demand come from. **Table 4-2** indicates

landscape use of up to 236 AFY, but Table 3-1 shows recycled water use of up to 535 AFY. Where will that recycled water be used and does it truly offset/reduce projected water demand as indicated in Table 3-1?

RESPONSE: AS DESCRIBED IN THE ADDED TEXT ON PAGE 15-16 THE AVAILABLE RESOURCES, (E.G., SUSTAINABLE YIELD AND RECYCLED WATER), USED IN THIS DOCUMENT REPRESENT THE BEST AVAILABLE METHOD OF DESCRIBING EXISTING RESOURCES AT THE TIME OF THIS DOCUMENT'S PUBLICATION. IT IS THE UNDERSTANDING OF THE DISTRICT THAT THERE WILL BE SUFFICIENT WATER RESOURCES TO MEET THE FUTURE DEMAND GIVEN THE MANAGEMENT GOALS AND CONSERVATION EFFORTS OF THE DISTRICT.
THE "OTHER DEMAND" VOLUME IS CALCULATED BY ASSESSING THE OTHER USERS IN THE SANTA MARGARITA GROUNDWATER BASIN. THIS VALUE REPRESENTS REMEDIATION WELLS, PRIVATE DOMESTIC WELLS, OTHER PRIVATE WATER SUPPLIERS, AND THE SAN LORENZO VALLEY WATER DISTRICT (SLVWD) WELLS. MOST OF THE PRODUCTION CONTRIBUTING TO THESE VOLUMES IS ASSUMED TO BE UNQUANTIFIABLE OR TO REMAIN CONSTANT WITH THE EXCEPTION OF THE SLVWD WELLS. TABLE 3-1 HAS BEEN REVISED TO REFLECT THE UPDATED INFORMATION PROVIDED BY THE SLVWD, DATA FOR THE DRAFT DOCUMENT WERE NOT AVAILABLE.
THE PROJECTED RECYCLED WATER DATA PRESENTED IN TABLE 3-1 REFLECTS THE AMOUNT OF RECYCLED WATER TO BE DISTRIBUTED TO ALL POTENTIAL USERS REGARDLESS OF CUSTOMER TYPE. THE MAXIMUM VALUE OF RECYCLED WATER USE PRESENTED IN TABLE 3-1 IS CALCULATED BASED ON THE DISTRICT'S IDENTIFICATION OF POTENTIAL CANDIDATES FOR CONVERSION TO RECYCLED WATER USE, SPECIFICALLY CUSTOMERS USING LARGE QUANTITIES OF POTABLE WATER FOR LANDSCAPING USE IN ADDITION TO OTHER DEMANDS. THE ANNUAL VOLUME IS CALCULATED BY INCREMENTALLY INCREASING RECYCLED WATER DELIVERIES RELATIVE TO THE EXPECTED PROGRESS OF ADDITIONAL RECYCLED WATER MAIN INFRASTRUCTURE, CUSTOMER RETROFIT OF EXISTING LATERALS, AND PUBLIC ACCEPTANCE. THESE USES ARE NOT REFLECTED IN TABLE 4-2 BECAUSE LANDSCAPING USES AT SPECIFIC INSTITUTIONS AND RESIDENCES ARE NOT SEPARATED IN THE PROJECTIONS. IT HAS YET TO BE DETERMINED WHICH CUSTOMER TYPES WILL CONVERT AND WHEN, ALTHOUGH THE TABLE IDENTIFIES THOSE CUSTOMERS WHICH USE THE WATER RESOURCES FOR THE SOLE PURPOSE OF LANDSCAPE IRRIGATION AND THEIR PROJECTED GROWTH, REGARDLESS OF OTHER MIXED USE CUSTOMERS (IE CUSTOMERS THAT USE BOTH RECYCLED AND POTABLE SUPPLIES). .

Table 4-3 and 4-4. It is unclear where the figures for supply and demand come from. Particularly the available supply seems to be inconsistent with other data presented.

RESPONSE: SUPPLY VOLUMES ARE PRESENTED AS THE SUSTAINABLE YIELD OF THE GROUNDWATER BASIN MINUS THE ANTICIPATED OTHER DEMAND. THE REDUCTIONS IN DEMAND ARE NOT APPLIED TO OTHER GROUNDWATER PRODUCERS IN THE BASIN. THEREFORE THE DISTRICT DOES NOT, AND DOES NOT ANTICIPATE HAVING ACCESS THOSE RESOURCES. THE DISTRICT'S REDUCED DEMAND REPRESENTS THE CONSUMPTION REDUCTION MEASURE APPLIED BY THE DISTRICT DURING TIMES OF DROUGHT.

Section 4.3 – The statement that future demand can be met under existing pumping conditions and with recycled water is not supported by the continuing conditions of overdraft and the uncertainties regarding actual future demand for recycled water.

RESPONSE: TEXT EDITED ON PAGE 33. ADDITIONALLY, THE UNCERTAINTIES ASSOCIATED WITH THE FUTURE DEMAND OF RECYCLED WATER CANNOT BE DEFINITIVELY QUANTIFIED. PROJECTED VOLUMES ARE THE RESULT OF THE DISTRICT'S EFFORTS TO IDENTIFY POTENTIAL RECYCLED WATER USERS AND ESTIMATE THE VOLUME ASSOCIATED WITH THEIR EXISTING LANDSCAPE IRRIGATION USES. PROJECTIONS FOR RECYCLED WATER DEMAND ARE ESTIMATES AND ARE USED AS GOALS FOR THE DISTRICT TO PROACTIVELY PROMOTE ITS RECYCLED WATER PROGRAM.

Section 6.4 – Under Catastrophe Scenarios 4, 5, and 6, it is unclear which six months are utilized in the scenarios. If the loss of two wells occurs during the peak summer use months, the impacts would be much greater than if the loss occurs during the off peak season. Could the numerical model be used to estimate impacts on streamflow as a result of pumping under the various drought scenarios?

RESPONSE: ASSESSMENT OF CATASTROPHIC SCENARIOS 4, 5, AND 6 ASSUMED THE LOSS OF TWO WELLS OCCURS IN THE FIRST HALF OF THE WATER YEAR (OCTOBER THROUGH MARCH). THIS ASSUMPTION WAS EMPLOYED SO AS TO STRESS THE DISTRICT WELLS WHICH REMAIN OPERATIONAL AND MUST PUMP AT HIGHER RATES DURING THE PERIOD OF LOWEST GROUNDWATER ELEVATION. ASSESSING THE ABILITY OF DISTRICT WELLS TO MEET DEMAND DURING THIS PERIOD WITHOUT DEWATERING WAS CONSIDERED CRITICAL TO ANALYSIS OF THE CATASTROPHIC SCENARIOS.

ASSESSING THE CATASTROPHIC SCENARIOS THROUGH THE LOSS OF TWO WATER SUPPLY WELLS DURING MONTHS OF PEAK GROUNDWATER PRODUCTION (APRIL THROUGH SEPTEMBER) HAS BEEN INVESTIGATED AND PRODUCES SIMILAR RESULTS WITH REGARD TO SCENARIOS 4 AND 5. THE POTENTIAL CATASTROPHIC LOSS OF SVWD WELLS 9 AND 10 DURING ANY 6 MONTH PERIOD OF THE WATER YEAR AS EVALUATED IN SCENARIO 4 CAN BE ADDRESSED THROUGH REDISTRIBUTION OF PUMPING TO OTHER DISTRICT WELLS.

SCENARIO 5 (THE LOSS OF PRODUCTION FROM SVWD WELLS 7A AND 3B) RESULTS IN A MAXIMUM CAPABLE PRODUCTION FROM REMAINING DISTRICT WELLS THAT FALLS SHORT OF AVERAGE DEMAND FOR THE PEAK DEMAND MONTHS BY AN AVERAGE OF 155 GPM. REDUCTION OF DISTRICT DEMAND THROUGH MANDATORY USAGE CUTBACK MEASURES, AS INVESTIGATED IN SCENARIO 6, ALLOWS FOR ADEQUATE SUPPLY FROM NON-IMPACTED DISTRICT WELLS THROUGH THE FIRST THREE MONTH OF THIS SCENARIO. UNDER THESE CONDITIONS, WELL 9 IS OBSERVED TO POTENTIALLY DEWATER APPROXIMATELY 3 MONTHS INTO THE 6 MONTH CATASTROPHIC PERIOD, LEADING TO A POTENTIAL LOSS OF UP TO 120 GPM OF PRODUCTION FROM DISTRICT WELLS DURING THE LATER HALF OF THE 6-MONTH CATASTROPHIC LOSS OF SVWD WELLS 7A AND 3B. THIS TEMPORARY LOSS OF SVWD WELL 9 WOULD POTENTIALLY REQUIRE AN ADDITIONAL 10% REDUCTION IN DEMAND FOR THE LATER 3 MONTHS OF THE 6 MONTH CATASTROPHIC LOSS OF SVWD WELLS 7A AND 3B.

Section 6.5 – Table 6-1 should present the minimum supply in just the portion of the basin available to the district. It would seem that the available minimum supply in a drought might need to be reduced in order to reduce adverse impacts on stream baseflow from reductions in groundwater levels.

RESPONSE: TABLE 6-1 EDITED TO REFLECT AVAILABLE STORAGE AS SUSTAINABLE YIELD OF BASIN MINUS OTHER DEMAND.

November 25, 2005

Scotts Valley Water District

Here are my questions:

- Why is there no reporting about the oil company hot-spot remediation at King's Village? How much water is being extracted? Estimated years of continued operation?
- Why is there no reporting about Watkins-Johnson remediation? How much water is being extracted? Estimated years of continued operation?
- What about reuse of the oil companies' hot-spot remediation water?
- Do the wells in North Scotts Valley show any recharge? Is there any possible way to recharge those wells?
- Why is there no clean up at the Hidden Oaks well?
- Isn't the Monte Fiore housing development/Hilton Hotel/new strip mall a part of SVWD (Gateway South)? Why isn't it shown on the maps? Are there other areas that are served SVWD water that are not shown on the maps?
- Is the South Scotts Valley Subbasin dewatered or close to it?

Thank you.

Sincerely,

Sue Roth, President
Manana Woods Mutual Water Company
P.O. Box 66929
Scotts Valley, CA 95067

831-438-5961

ETIC ENGINEERING

December 8, 2005

Sue Roth, President
Manana Woods Mutual Water Company
P.O. Box 66929
Scotts Valley, CA 95067

Subject: **Response to Comments for Scotts Valley Water District 2005 Urban Water Management Plan.**

Ms. Roth:

ETIC Engineering, Inc. (ETIC) has prepared this letter in response to comments provided by Mañana Woods Mutual Water Company's regarding the Scotts Valley Water District's (SVWD) 2005 Urban Water Management Plan (UWMP). ETIC and the District appreciate feedback regarding the specifics of the UWMP. The UWMP was drafted in accordance with the guidelines established by the California Department of Water Resources (DWR). The purpose of the UWMP is to provide the DWR with estimations of water use, supply, conservation efforts of the District, and criteria for emergency response to certain catastrophic scenarios.

Although some discussion in the plan relates to groundwater management and environmental contamination, these items will be documented in more detail in the SVWD's Groundwater Management Program Annual Report, which will be distributed to Mañana Woods Mutual Water Company for comment in the spring of 2006. Specific environmental sites such as the Watkins-Johnson site, the hydrocarbon remediation efforts in the Camp Evers area and at the Hidden Oaks well have historically been addressed in the Annual Report. Comments regarding the dewatering and potential recharge of subbasins are currently being studied by the District using all available data and the recently developed AB303 model discussed in the UWMP. These issues are of significant concern to the District and will be evaluated in detail as part of the District's groundwater management program and will also be documented in the Annual Report.

The District serves customers that are outside of District boundaries and are currently not annexed by the District. These customers include the Monte Fiore housing development and other commercial customers. Although these customers are not depicted on the map they are quantified in all past, current, and future projections for demand and customer type and have been accounted under the adjusted population values provided in Table 2.2 of the document.

The Final 2005 UWMP will be available for review at the District after filing with the DWR and copies can be provided to you upon request. If you have any additional questions or comments, please contact Charles McNiesh (831) 438-2363 at SVWD or Eric Zickler at (510) 208-1600 x18 at ETIC.

Sincerely,
ETIC ENGINEERING, INC.

Eric Zickler
Project Engineer

From: "Judith Panick" <judy@svchamber.org>
To: <cmcniesh@svwd.org>, <ezickler@eticeng.com>
Date: 11/15/05 2:27PM
Subject: Scotts Valley Water District

Eric:

I have reviewed the Draft 2005 Urban Water Management and Water Shortage Contingency Plan.

I feel that the report is well done and concise. I appreciate the outline, history and conservative nature of the forecasts.

I have professional experience and understanding of the critical nature of conservation and protection of our water resources, and my background as a governmental manager, which included managing a state agency public water source. That is the base of my experience; I do not have scientific or formal water management training.

Thank you for including me as part of the review committee.

Judy

Judith Panick, Executive Director

Scotts Valley Chamber of Commerce

4 Camp Evers Lane

Scotts Valley, CA 95066

(v) 831-438-1010 (f)831-438-6544

APPENDIX B

RESOLUTIONS AND ORDINANCES

RESOLUTION NO. 14-05

A RESOLUTION ADOPTING
2005 URBAN WATER MANAGEMENT PLAN AND
WATER SHORTABE CONTINGENCY PLAN

RESOLVED by the Board of Directors of the Scotts Valley Water District, Scotts Valley, California, that:

WHEREAS, the California Department of Water Resources enacted Assembly Bill 11X during the 1991 Extraordinary Session of the California Legislature (an act to amend California Water Code Sections 10620, 10621, 10631, and 10652, and to add Section 10656 to the California Water Code, relating to water); and,

WHEREAS, AB11X mandates that every urban water supplier providing municipal water directly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually shall develop an Urban Water Management Plan and Water Shortage Contingency Plan; and,

WHEREAS, AB11X mandates that said Plan shall be filed with the California Department of Water Resources; and,

WHEREAS, the Scotts Valley Water District is an urban supplier of water providing service to more than 3,000 customers, and therefore, has prepared and circulated for public review a Draft Urban Water Management Plan and Draft Water Shortage Contingency Plan; has held a noticed public hearing regarding said Draft plans on December 8, 2005, in compliance with the requirements of AB11X; and has prepared a Final Urban Water Management Plan and a Final Water Shortage Contingency Plan.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Scotts Valley Water District as follows:

1. The 2005 Urban Water Management Plan and the Water Shortage Contingency Plan is hereby adopted and ordered filed with the Secretary to the Board;
2. The General Manager is hereby authorized and directed to file these plans with the California Department of Water Resources;
3. The General Manager is hereby authorized to declare a Water Shortage Emergency pursuant to this Water Shortage Contingency Plan;
4. The General Manager shall implement this Water Shortage Contingency Plan and recommend to the District Board regarding additional procedures, rules, and regulations to carry out effective and equitable allocation of the water resource during a Water Shortage Emergency.

PASSED AND ADOPTED by the Board of Directors of the Scotts Valley Water District at a regular meeting thereof held on the 15th day of December 2005, by the following vote:

AYES: Directors:

NOES: Directors:

ABSENT: Directors:

ABSTAIN: Directors:

APPROVED:

_____
President

ATTEST:

_____
District Secretary

EXHIBIT C

ORDINANCE NO. 74-83

AN ORDINANCE TO ADOPT WATER CONSERVATION REGULATIONS PURSUANT TO THE PROVISIONS OF SECTION 2.5.1 OF ORDINANCE NO. 68-82

BE IT ORDAINED by the Board of Directors of the Scotts Valley Water District (Board), Santa Cruz County, California, as follows:

WHEREAS, the Board adopted Ordinance No. 68-82 on March 11, 1982, which provides authority in Section 2.5.1 to adopt Water Conservation Regulations; and

WHEREAS, water is a finite resource that should not be wasted; and

WHEREAS, it is imperative to the public well-being that those uses of water which constitute waste or abuse of the resource be prohibited; and

WHEREAS, it is necessary to conserve the water supply of the Scotts Valley Water District for the greatest public benefit and to discourage wasteful and unproductive uses of water; and

WHEREAS, the Board has considered the proposed Negative Declaration attached hereto and the comments received during the public review period; determines that the project will not have any significant effect on the environment and that a Negative Declaration has been prepared in accordance with the provisions of CEQA; and approves the Negative Declaration.

NOW, THEREFORE, BE IT ORDAINED, that the Board does hereby adopt the attached Water Conservation Regulations as authorized by Section 2.5.1 of Ordinance 68-82.

* * * * * * * * * * *

Passed and adopted this 14th day of April, 1983, by the following vote:

AYES: Directors Scothorn, Miles, Tetter, Dunkle

NOES: Directors None

ABSENT: Directors Snyder

Vice-PRESIDENT OF THE BOARD OF DIRECTORS

ATTEST:

Deborah L. Hazen
Secretary to Said Board

11-49

WATER CONSERVATION REGULATIONS
ADOPTED PURSUANT TO
SECTION 2.5.1

SECTION 1. - DECLARATION OF CONDITION

It is hereby found and declared that water is a finite resource and should not be wasted within the service area of the Scotts Valley Water District, and that it is necessary to prohibit and regulate water uses as provided in this Ordinance.

SECTION 2. - APPLICATION OF REGULATIONS

The provisions of this Ordinance shall apply to all persons using District water both within and outside the District Service Area, regardless of whether any person using water shall have a contract for water service with the District.

SECTION 3. - PROHIBITED WATER USES

The use and withdrawal of water by any person from District sources within the District for the following purposes is hereby prohibited:

Revised Ord. 74-83
Date APR. 14, 1983

A. The use of water from any fire hydrant unless specifically authorized by permit from the District, except by regularly constituted fire protection agencies for fire suppression purposes.

B. The watering of grass, lawn, groundcover, shrubbery, open ground, crops and trees, including agricultural irrigation, in a manner or to an extent which allows excess water to run to waste.

C. The escape of water through leaks, breaks, or malfunction within the water user's plumbing or distribution system for any period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of forty-eight (48) hours after the water user discovers such break, leak, or malfunction, or receives written notice from the District of such condition, whichever occurs first, is a reasonable time within which to correct such condition or to make arrangements for correction.

D. The use of water for washing cars, building exteriors, mobilehome exteriors, boats, sidewalks, driveways, or other exterior surfaces, without the use of a quick-acting positive shut-off nozzle on the hose.

E. The operation of any ornamental fountain, car wash, or other such structure using water from the District water system, unless water for such use is recycled.

F. The indiscriminate running of water or washing with water not otherwise prohibited above which is wasteful and without reasonable purpose.

SECTION 4. - DISCONNECTION

Any person in violation of the provisions of Section 3 who fails to take corrective action within forty-eight (48) hours after first written notification of the violation shall be subject to disconnection of water service.

SECTION 5. - NON-COMPLIANCE WITH REGULATIONS

Water service may be discontinued by the District for non-compliance with this or any other ordinance or regulation applicable to the water service and the District Manager is hereby authorized to terminate water service forty-eight (48) hours after written notice of the customer's non-compliance therewith. Water service will be reinstated under the terms and conditions of District Ordinances.

SECTION 6. - APPEAL TO THE DISTRICT BOARD

Should any applicant or customer be dissatisfied with the actions or decisions of the District Manager pursuant to the regulations or prohibitions herein set forth, said applicant may file an appeal of the decision of the District Manager with the Board of Directors of the District, which appeal shall be placed on the agenda of the District Board whose decision therein shall be final. The applicant

or customer may request a special meeting of the Board of Directors to consider the appeal, as provided in Section 1.5 of Ordinance 68-82.

Revised Ord. 74-83

Date APR. 14, 1983

ORDINANCE NO. 16.117

AN ORDINANCE OF THE CITY OF SCOTTS VALLEY ADDING CHAPTER 17.47 TO TITLE 17 OF THE SCOTTS VALLEY MUNICIPAL CODE RELATING TO THE USE OF RECYCLED WATER

BE IT ORDAINED by the City Council of the City of Scotts Valley as follows:

Section 1. A new Chapter 17.47 is hereby added to Title 17 of the Scotts Valley Municipal to read as follows:

"Chapter 17.47

RECYCLED WATER REGULATIONS

Sections:

17.47.010 Findings.

The Legislature of the State of California has adopted the Water Recycling in Landscaping Act (Gov. Code §§ 65601-65607, hereinafter referred to in this Chapter as the "Act"), along with sections 1009 and 13550-13556 of the California Water Code, evidencing a state-wide interest in developing facilities to reclaim and reuse water to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the State. Pursuant to the Act, the Scotts Valley Water District ("District") has notified the City that recycled water either is currently available or is expected to be available within ten years within the boundaries of the City. Recycled water is determined to be available pursuant to California Water Code section 13550 in new industrial, commercial or residential subdivisions located within the designated recycled water use areas in the City

17.46.020 Authority, Policy and Purpose.

These regulations are adopted under the authority of the Act. It is the policy of the City that recycled water which has been determined to be available pursuant to section 13550 of the California Water Code shall be used for nonpotable uses within the designated recycled water use areas as designated by the District when the City has determined (1) there is not an alternative higher or better use for the recycled water, (2) its use is economically justified, and (3) its use is financially and technically feasible for projects under review by the City. In furtherance of that policy, this Chapter establishes

the general rules and regulations governing the use and distribution of recycled water in accordance with applicable laws and regulations.

17.47.030 Recycled Water Areas.

The District, in cooperation with the City, has designated certain areas in the City as recycled water areas, all as set forth on a map, a copy of which is on file at the District offices. The District and City may, from time to time, modify the map and if new designations are established by the District, the District shall file an updated map with the Community Development Director within 60 days of such re-designation.

17.47.040 Recycled Water Use Rules and Regulations.

A. Subdivision Applications. No subdivision map for new development for any industrial, commercial or residential subdivision for which a tentative or parcel map is required by the City for parcels located within a recycled water project area shall be deemed complete without the subdivider having first provided the City with information adequate for the City to make the determinations set out in section 17.47.020. Upon receipt by City of an application for a tentative or parcel map for any industrial, commercial or residential subdivision the following procedure shall apply:

1. Referral to District for Recommendation. Upon application by a subdivider, and prior to deeming a new subdivision application complete, the Community Development Director shall refer the application to the District for review and recommendation regarding the use of recycled water and the installation of separate water meters and recycled water systems. The District shall make every effort to respond in writing within 30 days after the date of the referral, specifying its recommendation. The City need not consider the District's recommendation if it is not received within 30 days or if the pending application may be deemed approved under the Permit Streamlining Act before the recommendation is received.

2. City Action on Project. The City shall consider, as part of the subdivision review process, the recommendations of the District to determine if conditions of approval must be applied to the proposed subdivision to implement the policies established in this Chapter. After considering whether higher or better uses for recycled water exist and considering economic and financial feasibility as provided in this Chapter, the city council may add conditions to the map approval implementing the appropriate use of recycled water into the resulting improvements requiring the use of water that may be accomplished by use of recycled water. Common nonpotable uses that shall be considered for recycled water include, but are not limited to, irrigation of golf courses, parks, greenbelts, cemeteries, landscaped streets and medians, water intensive industrial uses, and other irrigation uses for both public and private development.

B. Public Improvements and Properties. Where deemed appropriate by the city council, existing and new city-owned or operated projects within a designated recycled water use area may be designed to accommodate recycled water. In addition, the City shall encourage other public agencies that are constructing projects with landscaping or other water intensive uses to work with the District to make use of recycled water where the construction is within a designated recycled water use area.

C. Major Industrial and Commercial Projects. Projects seeking discretionary approval from the city which involve the construction or re-construction of major industrial or commercial uses, especially those which have significant irrigation and/or water intensive aspects that can use recycled water and which are located in designated recycled water use areas, shall, as part of the review process, be treated like the subdivision processing set out in 17.47.040A, and where necessary, conditions attached which result in the use of recycled water.

D. Permits from State Agencies. Projects which are determined to be required for hook up to the recycled water system are required to work with the District to obtain the necessary permits from the State Department of Health Services prior to hooking up and using recycled water.

17.47.050 Separate Plumbing System.

Public or private projects which are required to install recycled water systems shall be required to construct a separate plumbing system to serve nonpotable uses where appropriate and with plans approved by the District. The separate system to serve nonpotable uses shall be independent of the plumbing system provided to serve domestic, residential, and other potable water uses in the subdivision or as part of the project under review.

17.47.060 Connection to Recycled Water Distributor

The District and any lawful successor responsible for the distribution of recyclable water in the City shall have the final authority whether to issue a recycled water connection permit. Issuance shall be subject to reasonable rules and regulations adopted by the District. If the construction of a recycled water system is a condition of approval required by the City and the District refuses to issue a permit, the applicant may seek removal of the condition by the City based upon the District's actions."

Section 2. APPLICABILITY. This Ordinance does not apply to any subdivision application which was deemed complete before the effective date of this recycled water ordinance.

Section 3. EFFECTIVE DATE. This Ordinance shall take effect thirty days after the date of its adoption. Prior to the expiration of fifteen days from the date of adoption, this Ordinance shall be published by one insertion in the Scotts Valley Banner a newspaper of general circulation in the City.

Section 4. SEVERABILITY. If any section, subsection, sentence, clause, phrase or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independent provision of such Ordinance and shall not affect the validity of the remaining portions thereof.

Section 5. CEQA COMPLIANCE. The City Council finds and determines that the enactment of this Ordinance is exempt pursuant to the California Environmental Quality Act ("CEQA;" Cal. Pub. Resources Code §§ 21000 et seq.) under the State CEQA Guidelines regarding protection of natural resources (Cal. Code of Regs., Title 14, § 15307).

This Ordinance was introduced on the 5th day of May, 2004, and passed and adopted on the 19 day of May, 2004, at a duly held meeting of the City Council of the City of Scotts Valley by the following vote:

AYES: Ainsworth, Aguilar, Johnson, Marigonda, Barrett

NOES:

ABSENT:

ABSTAIN:

Approved: _____
Cliff Barrett, Mayor

ATTEST:

_____
Judi Coffman, City Clerk

APPROVED AS TO FORM:

_____
~~Robert J. Logan~~, City Attorney
Kirsten M. Powell

C:\MyFiles\Ord forCodify\Ord 16.117.wpd

Chapter 17.47

RECYCLED WATER REGULATIONS

Sections:

17.47.010 Findings.

The Legislature of the State of California has adopted the Water Recycling in Landscaping Act (Gov. Code §§ 65601-65607, hereinafter referred to in this Chapter as the "Act"), along with sections 1009 and 13550-13556 of the California Water Code, evidencing a state-wide interest in developing facilities to reclaim and reuse water to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the State. Pursuant to the Act, the Scotts Valley Water District ("District") has notified the City that recycled water either is currently available or is expected to be available within ten years within the boundaries of the City. Recycled water is determined to be available pursuant to California Water Code section 13550 in new industrial, commercial or residential subdivisions located within the designated recycled water use areas in the City. (Ord. No. 16.117, § 1, 5-19-04)

17.46.020 Authority, Policy and Purpose.

These regulations are adopted under the authority of the Act. It is the policy of the City that recycled water which has been determined to be available pursuant to section 13550 of the California Water Code shall be used for nonpotable uses within the designated recycled water use areas as designated by the District when the City has determined (1) there is not an alternative higher or better use for the recycled water, (2) its use is economically justified, and (3) its use is financially and technically feasible for projects under review by the City. In furtherance of that policy, this Chapter establishes the general rules and regulations governing the use and distribution of recycled water in accordance with applicable laws and regulations. (Ord. No. 16.117, § 1, 5-19-04)

17.47.030 Recycled Water Areas.

The District, in cooperation with the City, has designated certain areas in the City as recycled water areas, all as set forth on a map, a copy of which is on file at the District offices. The District and City may, from time to time, modify the map and if new designations are established by the District, the District shall file an updated map with the Community Development Director within 60 days of such re-designation. (Ord. No. 16.117, § 1, 5-19-04)

17.47.040 Recycled Water Use Rules and Regulations.

A. Subdivision Applications. No subdivision map for new development for any industrial, commercial or residential subdivision for which a tentative or parcel map is required by the City for parcels located within a recycled water project area shall be deemed complete without the subdivider having first provided the City with information adequate for the City to make the determinations set out in section 17.47.020. Upon receipt by City of an application for a tentative or parcel map for any industrial, commercial or residential subdivision the following procedure shall apply:

1. Referral to District for Recommendation. Upon application by a subdivider, and prior to deeming a new subdivision application complete, the Community Development Director shall refer the application to the District for review and recommendation regarding the use of recycled water and the installation of separate water meters and recycled water systems. The District shall make every effort to respond in writing within 30 days after the date of the referral, specifying its recommendation. The City need not consider the District's recommendation if it is not received within 30 days or if the pending application may be deemed approved under the Permit Streamlining Act before the recommendation is received.

2. City Action on Project. The City shall consider, as part of the subdivision review process, the recommendations of the District to determine if conditions of approval must be applied to the proposed subdivision to implement the policies established in this Chapter. After considering whether higher or better uses for recycled water exist and considering economic and financial feasibility as provided in this Chapter, the city council may add conditions to the map approval implementing the appropriate use of recycled water into the resulting improvements requiring the use of water that may be accomplished by use of recycled water. Common nonpotable uses that shall be considered for recycled water include, but are not limited to, irrigation of golf courses, parks, greenbelts, cemeteries, landscaped streets and medians, water intensive industrial uses, and other irrigation uses for both public and private development.

B. Public Improvements and Properties. Where deemed appropriate by the city council, existing and new city-owned or operated projects within a designated recycled water use area may be designed to accommodate recycled water. In addition, the City shall encourage other public agencies that are constructing projects with landscaping or other water intensive uses to work with the District to make use of recycled water where the construction is within a designated recycled water use area.

C. Major Industrial and Commercial Projects. Projects seeking discretionary approval from the city which involve the construction or re-construction of major industrial or commercial uses, especially those which have significant irrigation and/or water intensive aspects that can use recycled water and which are located in designated recycled water use areas, shall, as part of the review process, be treated like the subdivision processing set out in 17.47.040A, and where necessary, conditions attached which result in the use of recycled water.

D. Permits from State Agencies. Projects which are determined to be required for hook up to the recycled water system are required to work with the District to obtain the necessary permits from the State Department of Health Services prior to hooking up and using recycled water. (Ord. No. 16.117, § 1, 5-19-04)

17.47.050 Separate Plumbing System.

Public or private projects which are required to install recycled water systems shall be required to construct a separate plumbing system to serve nonpotable uses where appropriate and with plans approved by the District. The separate system to serve nonpotable uses shall be independent of the plumbing system provided to serve domestic, residential, and other potable water uses in the subdivision or as part of the project under review. (Ord. No. 16.117, § 1, 5-19-04)

17.47.060 Connection to Recycled Water Distributor.

The District and any lawful successor responsible for the distribution of recyclable water in the City shall have the final authority whether to issue a recycled water connection permit. Issuance shall be subject to reasonable rules and regulations adopted by the District. If the construction of a recycled water system is a condition of approval required by the City and the District refuses to issue a permit, the applicant may seek removal of the condition by the City based upon the District's actions. (Ord. No. 16.117, § 1, 5-19-04)

APPENDIX C

GROUNDWATER MANAGEMENT PROGRAM 2003-2004 ANNUAL REPORT
(CD-ROM attached on back cover)

APPENDIX D

NUMERICAL MODELING SCENARIOS DATA

Appendix D

Water Shortage Scenarios - Numerical Model Input and Output Summary

Scenario	*Pumping*	*Recharge (Precipitation)*	*Results/Comments*
Scenario 1 1-year drought	Water year 2004 pumping rates used	Water year 1990 precipitation data used; based on lowest water year rainfall as recorded for entire model domain during past 20 years (1985 through 2004).	• All wells able to pump at needed capacities throughout model run • Storage loss within groundwater basin over 1-year drought estimated at 3,670 ac-ft
Scenario 2 5-year drought	Water year 2004 pumping rates used	Water year 1987 through 1991 precipitation data used; based on lowest 5-year series for rainfall as recorded for entire model domain during past 20 years (1985 through 2004).	• Full production demand not met due to declining water levels in South Scotts Valley subbasin, primarily due to predicted dewatering of SVWD Well 9 • Average yearly storage loss from the groundwater bain over 5-year drought estimated at 1,780 ac-ft
Scenario 3 5-year drought, with reduced demand measures implemented	Water year 2004 pumping rates used, with following reductions: Year 1 (no reduction), Year 2 (10% reduction) Year 3 (15% reduction) Year 4 (15% reduction) Year 5 (20% reduction)	Water year 1987 through 1991 precipitation data used; based on lowest 5-year series for rainfall as recorded for entire model domain during past 20 years (1985 through 2004).	• Under demand reduction scenario, loss in production due to dewatering of SVWD Well 9 can be offset through elevating pumping rates at other production wells (primarily wells 7A and 11B) • Average yearly storage loss from the groundwater bain over 5-year drought estimated at 1,670 ac-ft
Scenario 4 Loss of SVWD wells 9 and 10 due to environmental impacts for 6-month period	Groundwater extraction rates based on water year 2004, with SVWD wells 9 and 10 not pumping for first 6 months of 1-year model run. Remaining SVWD wells (wells 11A, 11B, 3B, and 7A) are pumped at elevated rates in order to attempt to offset the loss of SVWD wells #9 and #10.	Average annual recharge conditions, as assessed through analysis of past 20 years (1985 through 2004) of precipitation data for the model domain.	• Through elevation of pumping rates at non-impacted SVWD wells (11A, 11B, 3B, and 7A), adequate supply is maintained through 6-months loss of pumping from SVWD wells #9 and #10. • Annual storage loss from the groundwater basin for the 1-year simulation is estimated at 1,280 ac-ft
Scenario 5 Loss of SVWD wells 3B and 7A due to catastrophic event (e.g., earthquake) for 6-month period	Groundwater extraction rates based on water year 2004, with SVWD wells 3B and 7A not pumping for first 6 months of 1-year model run. Remaining SVWD wells (wells 9, 10, 11A, and 11B) are pumped at elevated rates in order to attempt to offset the loss of SVWD wells 3B and 7A.	Average annual precipitation conditions, as assessed through analysis of past 20 years (1985 through 2004) of precipitation data for the model domain.	• Elevation of pumping rates at non-impacted SVWD wells (#9, #10, 11A, and 11B), cannot fully offset loss of production due to loss of pumping from SVWD wells #7A and #3B. This is primarily due to the limited maximum capacity (as reported by SVWD staff) at wells #9 and #11A. • Annual storage loss for the 1-year simulation is estimated at 1,060 ac-ft • Scenario 6 investigates the potential of a 20% reduction in demand as a solution to the loss of water supply caused by the 6 month loss of SVWD wells #7A and 3B.
Scenario 6 Loss of SVWD wells 3B and 7A due to catastrophic event (e.g., earthquake) for 6-month period. Demand reductions of 20% instituted during 6 month period of supply disruption	Groundwater extraction rates based on water year 2004, with SVWD wells 3B and 7A not pumping for first 6 months of 1-year model run. Remaining SVWD wells (wells 9, 10, 11A, and 11B) are pumped at elevated rates in order to attempt to offset the loss of SVWD wells 3B and 7A. Total pumpage from operating SVWD wells reduced by 20% during first 6 months of 1-year model run.	Average annual precipitation conditions, as assessed through analysis of past 20 years (1985 through 2004) of precipitation data for the model domain.	• 20% demand reduction, in combination with redistribution of production lost from wells 3B and 7A to other SVWD wells, allows for adequate supply to be maintained over the course of the 1-year simulation. • Annual storage loss from the groundwater baisn for the 1-year simulation is estimated at 1,010 ac-ft